



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/US00/05308  <b>(22) International Filing Date:</b> 15 February 2000 (15.02.00)  <b>(30) Priority Data:</b> <table border="0"> <tr> <td>09/285,480</td> <td>2 April 1999 (02.04.99)</td> <td>US</td> </tr> <tr> <td>09/339,338</td> <td>23 June 1999 (23.06.99)</td> <td>US</td> </tr> <tr> <td>09/389,681</td> <td>2 September 1999 (02.09.99)</td> <td>US</td> </tr> <tr> <td>09/433,826</td> <td>3 November 1999 (03.11.99)</td> <td>US</td> </tr> </table> <b>(71) Applicant (for all designated States except US):</b> CORIXA CORPORATION [US/US]; 1124 Columbia Street, Suite 200, Seattle, WA 98104 (US).  <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> YUQIU, Jiang [CN/US]; 5001 South 232nd Street, Kent, WA 98032 (US). DILLON, Davin, C. [US/US]; 21607 N.E. 24th Street, Redmond, WA 98053 (US). MITCHAM, Jennifer, Lynn [US/US]; 16677 Northeast 88th Street, Redmond, WA 98052 (US). XU, Jiangchun [US/US]; 15805 S.E. 43rd Place, Bellevue, WA 98006 (US). HARLOCKER, Susan, L. [US/US]; 1124 Columbia Street, Suite 200, Seattle, WA 98104 (US).		09/285,480	2 April 1999 (02.04.99)	US	09/339,338	23 June 1999 (23.06.99)	US	09/389,681	2 September 1999 (02.09.99)	US	09/433,826	3 November 1999 (03.11.99)	US	<b>(74) Agents:</b> MAKI, David, J. et al.; Seed Intellectual Property Law Group PLLC, Suite 6300, 701 Fifth Avenue, Seattle, WA 98104-7092 (US).  <b>(81) Designated States:</b> AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>Without international search report and to be republished upon receipt of that report.</i>
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09/433,826	3 November 1999 (03.11.99)	US												
<b>(54) Title:</b> COMPOSITIONS FOR THE TREATMENT AND DIAGNOSIS OF BREAST CANCER AND METHODS FOR THEIR USE  <b>(57) Abstract</b>  Compositions and methods for the therapy and diagnosis of cancer, such as breast cancer, are disclosed. Compositions may comprise one or more breast tumor proteins, immunogenic portions thereof, or polynucleotides that encode such portions. Alternatively, a therapeutic composition may comprise an antigen presenting cell that expresses a breast tumor protein, or a T cell that is specific for cells expressing such a protein. Such compositions may be used, for example, for the prevention and treatment of diseases such as breast cancer. Diagnostic methods based on detecting a breast tumor protein, or mRNA encoding such a protein, in a sample are also provided.														

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EE	Estonia						

## COMPOSITIONS FOR THE TREATMENT AND DIAGNOSIS OF BREAST CANCER AND METHODS FOR THEIR USE

### TECHNICAL FIELD

The present invention relates generally to compositions and methods for the treatment of breast cancer. The invention is more particularly related to polypeptides comprising at least a portion of a protein that is preferentially expressed in breast tumor tissue and to polynucleotides encoding such polypeptides. Such polypeptides and polynucleotides may be used in vaccines and pharmaceutical compositions for treatment of breast cancer.

### BACKGROUND OF THE INVENTION

Breast cancer is a significant health problem for women in the United States and throughout the world. Although advances have been made in detection and treatment of the disease, breast cancer remains the second leading cause of cancer-related deaths in women, affecting more than 180,000 women in the United States each year. For women in North America, the life-time odds of getting breast cancer are one in eight.

No vaccine or other universally successful method for the prevention or treatment of breast cancer is currently available. Management of the disease currently relies on a combination of early diagnosis (through routine breast screening procedures) and aggressive treatment, which may include one or more of a variety of treatments such as surgery, radiotherapy, chemotherapy and hormone therapy. The course of treatment for a particular breast cancer is often selected based on a variety of prognostic parameters, including an analysis of specific tumor markers. *See, e.g., Porter-Jordan and Lippman, Breast Cancer 8:73-100 (1994).* However, the use of established markers often leads to a result that is difficult to interpret, and the high mortality observed in breast cancer patients indicates that improvements are needed in the treatment, diagnosis and prevention of the disease.

Accordingly, there is a need in the art for improved methods for the treatment and diagnosis of breast cancer. The present invention fulfills these needs and further provides other related advantages.

## SUMMARY OF THE INVENTION

The present invention provides compounds and methods for the treatment and diagnosis of cancer, such as breast cancer. In one aspect, isolated polypeptides are provided comprising at least a portion of a breast tumor protein or a variant thereof. Certain portions and other variants are immunogenic, such that the ability of the variant to react with protein-specific antisera is not substantially diminished. With certain embodiments, the polypeptide comprises an amino acid sequence encoded by a polynucleotide selected from the group consisting of: (a) nucleotide sequences recited in SEQ ID NO: 1-61, 63-175, 178, 180, 182-313, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468; (b) complements of said nucleotide sequences; and (c) variants of a sequence of (a) or (b). In specific embodiments, the inventive polypeptides comprise at least a portion of a tumor antigen that comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 62, 176, 179, 181 and 469-473.

In related aspects, isolated polynucleotides encoding the above polypeptides, or a portion thereof (such as a portion encoding at least 15 contiguous amino acid residues of a breast tumor protein), are provided. In specific embodiments, such polynucleotides comprise a sequence selected from the group consisting of sequences provided in SEQ ID NO: 1-61, 63-175, 178, 180, 182-313, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 and variants thereof. The present invention further provides expression vectors comprising the above polynucleotides, together with host cells transformed or transfected with such expression vectors. In preferred embodiments, the host cells are selected from the group consisting of *E. coli*, yeast and mammalian cells.

In another aspect, the present invention provides fusion proteins comprising a first and a second inventive polypeptide or, alternatively, an inventive polypeptide and a known breast tumor antigen.



The present invention also provides pharmaceutical compositions comprising at least one of the above polypeptides, or a polynucleotide encoding such a polypeptide, and a physiologically acceptable carrier, together with vaccines. For prophylactic or therapeutic use, comprising at least one such polypeptide or polynucleotide in combination with an immunostimulant. Pharmaceutical compositions and vaccines comprising one or more of the above fusion proteins are also provided.

The present invention further provides pharmaceutical compositions that comprise: (a) an antibody or antigen-binding fragment thereof that specifically binds to a breast tumor protein; and (b) a physiologically acceptable carrier.

Within further aspects, the present invention provides pharmaceutical compositions comprising: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) a pharmaceutically acceptable carrier or excipient. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B cells.

Within related aspects, vaccines are provided that comprise: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) an immunostimulant.

In yet another aspect, methods are provided for inhibiting the development of breast cancer in a patient, comprising administering an effective amount of at least one of the above pharmaceutical compositions and/or vaccines.

The present invention further provides, within other aspects, methods for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a breast tumor protein, wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the protein from the sample.

Within related aspects, methods are provided for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated as described above.

Methods are further provided, within other aspects, for stimulating and/or expanding T cells specific for a breast tumor protein, comprising contacting T cells with one or more of: (i) a polypeptide as described above; (ii) a polynucleotide encoding such a polypeptide; and/or (iii) an antigen presenting cell that expresses such a polypeptide;

under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells. Isolated T cell populations comprising T cells prepared as described above are also provided.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population as described above.

The present invention further provides methods for inhibiting the development of a cancer in a patient, comprising the steps of: (a) incubating CD4<sup>+</sup> and/or CD8<sup>+</sup> T cells isolated from a patient with one or more of: (i) a polypeptide comprising at least an immunogenic portion of a breast tumor protein; (ii) a polynucleotide encoding such a polypeptide; and (iii) an antigen-presenting cell that expressed such a polypeptide; and (b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient. Proliferated cells may, but need not, be cloned prior to administration to the patient.

The polypeptides disclosed herein may be usefully employed in the diagnosis and monitoring of breast cancer. In one aspect of the present invention, methods are provided for detecting a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that is capable of binding to one of the above polypeptides; and (b) detecting in the sample an amount of polypeptide that binds to the binding agent; and (c) comparing the amount of polypeptide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in a patient. In preferred embodiments, the binding agent is an antibody, most preferably a monoclonal antibody. The cancer may be breast cancer.

In related aspects, methods are provided for monitoring the progression of a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that is capable of binding to one of the above polypeptides; (b) detecting in the sample an amount of a polypeptide that binds to the binding agent; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amounts of polypeptide detected in steps (b) and (c).

Within related aspects, the present invention provides antibodies, preferably monoclonal antibodies, that bind to the inventive polypeptides, as well as diagnostic kits comprising such antibodies, and methods of using such antibodies to inhibit the development of breast cancer.

The present invention further provides, within other aspects, methods for determining the presence or absence of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a breast tumor protein; (b) detecting in the sample a level of a polynucleotide, preferably mRNA, that hybridizes to the oligonucleotide; and (c) comparing the level of polynucleotide that hybridizes to the oligonucleotide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within certain embodiments, the amount of mRNA is detected via polymerase chain reaction using, for example, at least one oligonucleotide primer that hybridizes to a polynucleotide encoding a polypeptide as recited above, or a complement of such a polynucleotide. Within other embodiments, the amount of mRNA is detected using a hybridization technique, employing an oligonucleotide probe that hybridizes to a polynucleotide that encodes a polypeptide as recited above, or a complement of such a polynucleotide.

In related aspects, diagnostic kits comprising the above oligonucleotide probes or primers are provided.

These and other aspects of the present invention will become apparent upon reference to the following detailed description. All references disclosed herein are hereby incorporated by reference in their entirety as if each was incorporated individually.

#### BRIEF DESCRIPTION OF THE DRAWING AND SEQUENCE IDENTIFIERS

Fig. 1 shows the results of a Northern blot of the clone SYN18C6 (SEQ ID NO: 40).

SEQ ID NO: 1 is the determined cDNA sequence of JBT2.

SEQ ID NO: 2 is the determined cDNA sequence of JBT6.

SEQ ID NO: 3 is the determined cDNA sequence of JBT7.

SEQ ID NO: 4 is the determined cDNA sequence of JBT10.  
SEQ ID NO: 5 is the determined cDNA sequence of JBT13.  
SEQ ID NO: 6 is the determined cDNA sequence of JBT14.  
SEQ ID NO: 7 is the determined cDNA sequence of JBT15.  
SEQ ID NO: 8 is the determined cDNA sequence of JBT16.  
SEQ ID NO: 9 is the determined cDNA sequence of JBT17.  
SEQ ID NO: 10 is the determined cDNA sequence of JBT22.  
SEQ ID NO: 11 is the determined cDNA sequence of JBT25.  
SEQ ID NO: 12 is the determined cDNA sequence of JBT28.  
SEQ ID NO: 13 is the determined cDNA sequence of JBT32.  
SEQ ID NO: 14 is the determined cDNA sequence of JBT33.  
SEQ ID NO: 15 is the determined cDNA sequence of JBT34.  
SEQ ID NO: 16 is the determined cDNA sequence of JBT36.  
SEQ ID NO: 17 is the determined cDNA sequence of JBT37.  
SEQ ID NO: 18 is the determined cDNA sequence of JBT51.  
SEQ ID NO: 19 is the determined cDNA sequence of JBTT1.  
SEQ ID NO: 20 is the determined cDNA sequence of JBTT7.  
SEQ ID NO: 21 is the determined cDNA sequence of JBTT11.  
SEQ ID NO: 22 is the determined cDNA sequence of JBTT14.  
SEQ ID NO: 23 is the determined cDNA sequence of JBTT18.  
SEQ ID NO: 24 is the determined cDNA sequence of JBTT19.  
SEQ ID NO: 25 is the determined cDNA sequence of JBTT20.  
SEQ ID NO: 26 is the determined cDNA sequence of JBTT21.  
SEQ ID NO: 27 is the determined cDNA sequence of JBTT22.  
SEQ ID NO: 28 is the determined cDNA sequence of JBTT28.  
SEQ ID NO: 29 is the determined cDNA sequence of JBTT29.  
SEQ ID NO: 30 is the determined cDNA sequence of JBTT33.  
SEQ ID NO: 31 is the determined cDNA sequence of JBTT37.  
SEQ ID NO: 32 is the determined cDNA sequence of JBTT38.  
SEQ ID NO: 33 is the determined cDNA sequence of JBTT47.  
SEQ ID NO: 34 is the determined cDNA sequence of JBTT48.

SEQ ID NO: 35 is the determined cDNA sequence of JBTT50.  
SEQ ID NO: 36 is the determined cDNA sequence of JBTT51.  
SEQ ID NO: 37 is the determined cDNA sequence of JBTT52.  
SEQ ID NO: 38 is the determined cDNA sequence of JBTT54.  
SEQ ID NO: 39 is the determined cDNA sequence of SYN17F4.  
SEQ ID NO: 40 is the determined cDNA sequence of SYN18C6.  
SEQ ID NO: 41 is the determined cDNA sequence of SYN19A2.  
SEQ ID NO: 42 is the determined cDNA sequence of SYN19C8.  
SEQ ID NO: 43 is the determined cDNA sequence of SYN20A12.  
SEQ ID NO: 44 is the determined cDNA sequence of SYN20G6.  
SEQ ID NO: 45 is the determined cDNA sequence of SYN20G6-2.  
SEQ ID NO: 46 is the determined cDNA sequence of SYN21B9.  
SEQ ID NO: 47 is the determined cDNA sequence of SYN21B9-2.  
SEQ ID NO: 48 is the determined cDNA sequence of SYN21C10.  
SEQ ID NO: 49 is the determined cDNA sequence of SYN21G10.  
SEQ ID NO: 50 is the determined cDNA sequence of SYN21G10-2.  
SEQ ID NO: 51 is the determined cDNA sequence of SYN21G11.  
SEQ ID NO: 52 is the determined cDNA sequence of SYN21G11-2.  
SEQ ID NO: 53 is the determined cDNA sequence of SYN21H8.  
SEQ ID NO: 54 is the determined cDNA sequence of SYN22A10.  
SEQ ID NO: 55 is the determined cDNA sequence of SYN22A10-2.  
SEQ ID NO: 56 is the determined cDNA sequence of SYN22A12.  
SEQ ID NO: 57 is the determined cDNA sequence of SYN22A2.  
SEQ ID NO: 58 is the determined cDNA sequence of SYN22B4.  
SEQ ID NO: 59 is the determined cDNA sequence of SYN22C2.  
SEQ ID NO: 60 is the determined cDNA sequence of SYN22E10.  
SEQ ID NO: 61 is the determined cDNA sequence of SYN22F2.  
SEQ ID NO: 62 is a predicted amino acid sequence for SYN18C6.  
SEQ ID NO: 63 is the determined cDNA sequence of B723P.  
SEQ ID NO: 64 is the determined cDNA sequence for B724P.  
SEQ ID NO: 65 is the determined cDNA sequence of B770P.

SEQ ID NO: 66 is the determined cDNA sequence of B716P.

SEQ ID NO: 67 is the determined cDNA sequence of B725P.

SEQ ID NO: 68 is the determined cDNA sequence of B717P.

SEQ ID NO: 69 is the determined cDNA sequence of B771P.

SEQ ID NO: 70 is the determined cDNA sequence of B722P.

SEQ ID NO: 71 is the determined cDNA sequence of B726P.

SEQ ID NO: 72 is the determined cDNA sequence of B727P.

SEQ ID NO: 73 is the determined cDNA sequence of B728P.

SEQ ID NO: 74-87 are the determined cDNA sequences of isolated clones

which show homology to known sequences.

SEQ ID NO: 88 is the determined cDNA sequence of 13053.

SEQ ID NO: 89 is the determined cDNA sequence of 13057.

SEQ ID NO: 90 is the determined cDNA sequence of 13059.

SEQ ID NO: 91 is the determined cDNA sequence of 13065.

SEQ ID NO: 92 is the determined cDNA sequence of 13067.

SEQ ID NO: 93 is the determined cDNA sequence of 13068.

SEQ ID NO: 94 is the determined cDNA sequence of 13071.

SEQ ID NO: 95 is the determined cDNA sequence of 13072.

SEQ ID NO: 96 is the determined cDNA sequence of 13073.

SEQ ID NO: 97 is the determined cDNA sequence of 13075.

SEQ ID NO: 98 is the determined cDNA sequence of 13078.

SEQ ID NO: 99 is the determined cDNA sequence of 13079.

SEQ ID NO: 100 is the determined cDNA sequence of 13081.

SEQ ID NO: 101 is the determined cDNA sequence of 13082.

SEQ ID NO: 102 is the determined cDNA sequence of 13092.

SEQ ID NO: 103 is the determined cDNA sequence of 13097.

SEQ ID NO: 104 is the determined cDNA sequence of 13101.

SEQ ID NO: 105 is the determined cDNA sequence of 13102.

SEQ ID NO: 106 is the determined cDNA sequence of 13119.

SEQ ID NO: 107 is the determined cDNA sequence of 13131.

SEQ ID NO: 108 is the determined cDNA sequence of 13133.

SEQ ID NO: 109 is the determined cDNA sequence of 13135.  
SEQ ID NO: 110 is the determined cDNA sequence of 13139.  
SEQ ID NO: 111 is the determined cDNA sequence of 13140.  
SEQ ID NO: 112 is the determined cDNA sequence of 13146.  
SEQ ID NO: 113 is the determined cDNA sequence of 13147.  
SEQ ID NO: 114 is the determined cDNA sequence of 13148.  
SEQ ID NO: 115 is the determined cDNA sequence of 13149.  
SEQ ID NO: 116 is the determined cDNA sequence of 13151.  
SEQ ID NO: 117 is the determined cDNA sequence of 13051  
SEQ ID NO: 118 is the determined cDNA sequence of 13052  
SEQ ID NO: 119 is the determined cDNA sequence of 13055  
SEQ ID NO: 120 is the determined cDNA sequence of 13058  
SEQ ID NO: 121 is the determined cDNA sequence of 13062  
SEQ ID NO: 122 is the determined cDNA sequence of 13064  
SEQ ID NO: 123 is the determined cDNA sequence of 13080  
SEQ ID NO: 124 is the determined cDNA sequence of 13093  
SEQ ID NO: 125 is the determined cDNA sequence of 13094  
SEQ ID NO: 126 is the determined cDNA sequence of 13095  
SEQ ID NO: 127 is the determined cDNA sequence of 13096  
SEQ ID NO: 128 is the determined cDNA sequence of 13099  
SEQ ID NO: 129 is the determined cDNA sequence of 13100  
SEQ ID NO: 130 is the determined cDNA sequence of 13103  
SEQ ID NO: 131 is the determined cDNA sequence of 13106  
SEQ ID NO: 132 is the determined cDNA sequence of 13107  
SEQ ID NO: 133 is the determined cDNA sequence of 13108  
SEQ ID NO: 134 is the determined cDNA sequence of 13121  
SEQ ID NO: 135 is the determined cDNA sequence of 13126  
SEQ ID NO: 136 is the determined cDNA sequence of 13129  
SEQ ID NO: 137 is the determined cDNA sequence of 13130  
SEQ ID NO: 138 is the determined cDNA sequence of 13134  
SEQ ID NO: 139 is the determined cDNA sequence of 13141

SEQ ID NO: 140 is the determined cDNA sequence of 13142  
SEQ ID NO: 141 is the determined cDNA sequence of 14376  
SEQ ID NO: 142 is the determined cDNA sequence of 14377  
SEQ ID NO: 143 is the determined cDNA sequence of 14383  
SEQ ID NO: 144 is the determined cDNA sequence of 14384  
SEQ ID NO: 145 is the determined cDNA sequence of 14387  
SEQ ID NO: 146 is the determined cDNA sequence of 14392  
SEQ ID NO: 147 is the determined cDNA sequence of 14394  
SEQ ID NO: 148 is the determined cDNA sequence of 14398  
SEQ ID NO: 149 is the determined cDNA sequence of 14401  
SEQ ID NO: 150 is the determined cDNA sequence of 14402  
SEQ ID NO: 151 is the determined cDNA sequence of 14405  
SEQ ID NO: 152 is the determined cDNA sequence of 14409  
SEQ ID NO: 153 is the determined cDNA sequence of 14412  
SEQ ID NO: 154 is the determined cDNA sequence of 14414  
SEQ ID NO: 155 is the determined cDNA sequence of 14415  
SEQ ID NO: 156 is the determined cDNA sequence of 14416  
SEQ ID NO: 157 is the determined cDNA sequence of 14419  
SEQ ID NO: 158 is the determined cDNA sequence of 14426  
SEQ ID NO: 159 is the determined cDNA sequence of 14427  
SEQ ID NO: 160 is the determined cDNA sequence of 14375  
SEQ ID NO: 161 is the determined cDNA sequence of 14378  
SEQ ID NO: 162 is the determined cDNA sequence of 14379  
SEQ ID NO: 163 is the determined cDNA sequence of 14380  
SEQ ID NO: 164 is the determined cDNA sequence of 14381  
SEQ ID NO: 165 is the determined cDNA sequence of 14382  
SEQ ID NO: 166 is the determined cDNA sequence of 14388  
SEQ ID NO: 167 is the determined cDNA sequence of 14399  
SEQ ID NO: 168 is the determined cDNA sequence of 14406  
SEQ ID NO: 169 is the determined cDNA sequence of 14407  
SEQ ID NO: 170 is the determined cDNA sequence of 14408



SEQ ID NO: 171 is the determined cDNA sequence of 14417

SEQ ID NO: 172 is the determined cDNA sequence of 14418

SEQ ID NO: 173 is the determined cDNA sequence of 14423

SEQ ID NO: 174 is the determined cDNA sequence of 14424

SEQ ID NO: 175 is the determined cDNA sequence of B726P-20

SEQ ID NO: 176 is the predicted amino acid sequence of B726P-20

SEQ ID NO: 177 is a PCR primer

SEQ ID NO: 178 is the determined cDNA sequence of B726P-74

SEQ ID NO: 179 is the predicted amino acid sequence of B726P-74

SEQ ID NO: 180 is the determined cDNA sequence of B726P-79

SEQ ID NO: 181 is the predicted amino acid sequence of B726P-79

SEQ ID NO: 182 is the determined cDNA sequence of 19439.1, showing homology to the mammaglobin gene

SEQ ID NO: 183 is the determined cDNA sequence of 19407.1, showing homology to the human keratin gene

SEQ ID NO: 184 is the determined cDNA sequence of 19428.1, showing homology to human chromosome 17 clone

SEQ ID NO: 185 is the determined cDNA sequence of B808P (19408), showing no significant homology to any known gene

SEQ ID NO: 186 is the determined cDNA sequence of 19460.1, showing no significant homology to any known gene

SEQ ID NO: 187 is the determined cDNA sequence of 19419.1, showing homology to Ig kappa light chain

SEQ ID NO: 188 is the determined cDNA sequence of 19411.1, showing homology to human alpha-1 collagen

SEQ ID NO: 189 is the determined cDNA sequence of 19420.1, showing homology to mus musculus proteinase-3

SEQ ID NO: 190 is the determined cDNA sequence of 19432.1, showing homology to human high motility group box

SEQ ID NO: 191 is the determined cDNA sequence of 19412.1, showing homology to the human plasminogen activator gene

SEQ ID NO: 192 is the determined cDNA sequence of 19415.1, showing homology to mitogen activated protein kinase

SEQ ID NO: 193 is the determined cDNA sequence of 19409.1, showing homology to the chondroitin sulfate proteoglycan protein

SEQ ID NO: 194 is the determined cDNA sequence of 19406.1, showing no significant homology to any known gene

SEQ ID NO: 195 is the determined cDNA sequence of 19421.1, showing homology to human fibronectin

SEQ ID NO: 196 is the determined cDNA sequence of 19426.1, showing homology to the retinoic acid receptor responder 3

SEQ ID NO: 197 is the determined cDNA sequence of 19425.1, showing homology to MyD88 mRNA

SEQ ID NO: 198 is the determined cDNA sequence of 19424.1, showing homology to peptide transporter (TAP-1) mRNA

SEQ ID NO: 199 is the determined cDNA sequence of 19429.1, showing no significant homology to any known gene

SEQ ID NO: 200 is the determined cDNA sequence of 19435.1, showing homology to human polymorphic epithelial mucin

SEQ ID NO: 201 is the determined cDNA sequence of B813P (19434.1), showing homology to human GATA-3 transcription factor

SEQ ID NO: 202 is the determined cDNA sequence of 19461.1, showing homology to the human AP-2 gene

SEQ ID NO: 203 is the determined cDNA sequence of 19450.1, showing homology to DNA binding regulatory factor

SEQ ID NO: 204 is the determined cDNA sequence of 19451.1, showing homology to Na/H exchange regulatory co-factor

SEQ ID NO: 205 is the determined cDNA sequence of 19462.1, showing no significant homology to any known gene

SEQ ID NO: 206 is the determined cDNA sequence of 19455.1, showing homology to human mRNA for histone HAS.Z

SEQ ID NO: 207 is the determined cDNA sequence of 19459.1, showing

homology to PAC clone 179N16

SEQ ID NO: 208 is the determined cDNA sequence of 19464.1, showing no significant homology to any known gene

SEQ ID NO: 209 is the determined cDNA sequence of 19414.1, showing homology to lipophilin B

SEQ ID NO: 210 is the determined cDNA sequence of 19413.1, showing homology to chromosome 17 clone hRPK.209\_J\_20

SEQ ID NO: 211 is the determined cDNA sequence of 19416.1, showing no significant homology to any known gene

SEQ ID NO: 212 is the determined cDNA sequence of 19437.1, showing homology to human clone 24976 mRNA

SEQ ID NO: 213 is the determined cDNA sequence of 19449.1, showing homology to mouse DNA for PG-M core protein

SEQ ID NO: 214 is the determined cDNA sequence of 19446.1, showing no significant homology to any known gene

SEQ ID NO: 215 is the determined cDNA sequence of 19452.1, showing no significant homology to any known gene

SEQ ID NO: 216 is the determined cDNA sequence of 19483.1, showing no significant homology to any known gene

SEQ ID NO: 217 is the determined cDNA sequence of 19526.1, showing homology to human lipophilin C

SEQ ID NO: 218 is the determined cDNA sequence of 19484.1, showing homology to the secreted cement gland protein XAG-2

SEQ ID NO: 219 is the determined cDNA sequence of 19470.1, showing no significant homology to any known gene

SEQ ID NO: 220 is the determined cDNA sequence of 19469.1, showing homology to the human HLA-DM gene

SEQ ID NO: 221 is the determined cDNA sequence of 19482.1, showing homology to the human pS2 protein gene

SEQ ID NO: 222 is the determined cDNA sequence of B805P (19468.1), showing no significant homology to any known gene

SEQ ID NO: 223 is the determined cDNA sequence of 19467.1, showing homology to human thrombospondin mRNA

SEQ ID NO: 224 is the determined cDNA sequence of 19498.1, showing homology to the CDC2 gene involved in cell cycle control

SEQ ID NO: 225 is the determined cDNA sequence of 19506.1, showing homology to human cDNA for TREB protein

SEQ ID NO: 226 is the determined cDNA sequence of B806P (19505.1), showing no significant homology to any known gene

SEQ ID NO: 227 is the determined cDNA sequence of 19486.1, showing homology to type I epidermal keratin

SEQ ID NO: 228 is the determined cDNA sequence of 19510.1, showing homology to glucose transporter for glycoprotein

SEQ ID NO: 229 is the determined cDNA sequence of 19512.1, showing homology to the human lysyl hydroxylase gene

SEQ ID NO: 230 is the determined cDNA sequence of 19511.1, showing homology to human palmitoyl-protein thioesterase

SEQ ID NO: 231 is the determined cDNA sequence of 19508.1, showing homology to human alpha enolase

SEQ ID NO: 232 is the determined cDNA sequence of B807P (19509.1), showing no significant homology to any known gene

SEQ ID NO: 233 is the determined cDNA sequence of B809P (19520.1), showing homology to clone 102D24 on chromosome 11q13.31

SEQ ID NO: 234 is the determined cDNA sequence of 19507.1, showing homology to prosome beta-subunit

SEQ ID NO: 235 is the determined cDNA sequence of 19525.1, showing homology to human pro-urokinase precursor

SEQ ID NO: 236 is the determined cDNA sequence of 19513.1, showing no significant homology to any known gene

SEQ ID NO: 237 is the determined cDNA sequence of 19517.1, showing homology to human PAC 128M19 clone

SEQ ID NO: 238 is the determined cDNA sequence of 19564.1, showing

homology to human cytochrome P450-IIB

SEQ ID NO: 239 is the determined cDNA sequence of 19553.1. showing homology to human GABA-A receptor pi subunit

SEQ ID NO: 240 is the determined cDNA sequence of B811P (19575.1), showing no significant homology to any known gene

SEQ ID NO: 241 is the determined cDNA sequence of B810P (19560.1), showing no significant homology to any known gene

SEQ ID NO: 242 is the determined cDNA sequence of 19588.1, showing homology to aortic carboxypeptidase-like protein

SEQ ID NO: 243 is the determined cDNA sequence of 19551.1, showing homology to human BCL-1 gene

SEQ ID NO: 244 is the determined cDNA sequence of 19567.1, showing homology to human proteasome-related mRNA

SEQ ID NO: 245 is the determined cDNA sequence of B803P (19583.1), showing no significant homology to any known gene

SEQ ID NO: 246 is the determined cDNA sequence of B812P (19587.1), showing no significant homology to any known gene

SEQ ID NO: 247 is the determined cDNA sequence of B802P (19392.2), showing homology to human chromosome 17

SEQ ID NO: 248 is the determined cDNA sequence of 19393.2, showing homology to human nicein B2 chain

SEQ ID NO: 249 is the determined cDNA sequence of 19398.2, human MHC class II DQ alpha mRNA

SEQ ID NO: 250 is the determined cDNA sequence of B804P (19399.2), showing homology to human Xp22 BAC GSHB-184P14

SEQ ID NO: 251 is the determined cDNA sequence of 19401.2, showing homology to human ikB kinase-b gene

SEQ ID NO: 252 is the determined cDNA sequence of 20266, showing no significant homology to any known gene

SEQ ID NO: 253 is the determined cDNA sequence of B826P (20270), showing no significant homology to any known gene

SEQ ID NO: 254 is the determined cDNA sequence of 20274, showing no significant homology to any known gene

SEQ ID NO: 255 is the determined cDNA sequence of 20276, showing no significant homology to any known gene

SEQ ID NO: 256 is the determined cDNA sequence of 20277, showing no significant homology to any known gene

SEQ ID NO: 257 is the determined cDNA sequence of B823P (20280), showing no significant homology to any known gene

SEQ ID NO: 258 is the determined cDNA sequence of B821P (20281), showing no significant homology to any known gene

SEQ ID NO: 259 is the determined cDNA sequence of B824P (20294), showing no significant homology to any known gene

SEQ ID NO: 260 is the determined cDNA sequence of 20303, showing no significant homology to any known gene

SEQ ID NO: 261 is the determined cDNA sequence of B820P (20310), showing no significant homology to any known gene

SEQ ID NO: 262 is the determined cDNA sequence of B825P (20336), showing no significant homology to any known gene

SEQ ID NO: 263 is the determined cDNA sequence of B827P (20341), showing no significant homology to any known gene

SEQ ID NO: 264 is the determined cDNA sequence of 20941, showing no significant homology to any known gene

SEQ ID NO: 265 is the determined cDNA sequence of 20954, showing no significant homology to any known gene

SEQ ID NO: 266 is the determined cDNA sequence of 20961, showing no significant homology to any known gene

SEQ ID NO: 267 is the determined cDNA sequence of 20965, showing no significant homology to any known gene

SEQ ID NO: 268 is the determined cDNA sequence of 20975, showing no significant homology to any known gene

SEQ ID NO: 269 is the determined cDNA sequence of 20261, showing

homology to Human p120 catenin

SEQ ID NO: 270 is the determined cDNA sequence of B822P (20262), showing homology to Human membrane glycoprotein 4F2

SEQ ID NO: 271 is the determined cDNA sequence of 20265, showing homology to Human Na, K-ATPase Alpha 1

SEQ ID NO: 272 is the determined cDNA sequence of 20267, showing homology to Human heart HS 90, partial cds

SEQ ID NO: 273 is the determined cDNA sequence of 20268, showing homology to Human mRNA GPI-anchored protein p137

SEQ ID NO: 274 is the determined cDNA sequence of 20271, showing homology to Human cleavage stimulation factor 77 kDa subunit

SEQ ID NO: 275 is the determined cDNA sequence of 20272, showing homology to Human p190-B

SEQ ID NO: 276 is the determined cDNA sequence of 20273, showing homology to Human ribophorin

SEQ ID NO: 277 is the determined cDNA sequence of 20278, showing homology to Human ornithine amino transferase

SEQ ID NO: 278 is the determined cDNA sequence of 20279, showing homology to Human S-adenosylmethionine synthetase

SEQ ID NO: 279 is the determined cDNA sequence of 20293, showing homology to Human x inactivation transcript

SEQ ID NO: 280 is the determined cDNA sequence of 20300, showing homology to Human cytochrome p450

SEQ ID NO: 281 is the determined cDNA sequence of 20305, showing homology to Human elongation factor-1 alpha

SEQ ID NO: 282 is the determined cDNA sequence of 20306, showing homology to Human epithelial ets protein

SEQ ID NO: 283 is the determined cDNA sequence of 20307, showing homology to Human signal transducer mRNA

SEQ ID NO: 284 is the determined cDNA sequence of 20313, showing homology to Human GABA-A receptor pi subunit mRNA

SEQ ID NO: 285 is the determined cDNA sequence of 20317, showing homology to Human tyrosine phosphatase

SEQ ID NO: 286 is the determined cDNA sequence of 20318, showing homology to Human cathepsine B proteinase

SEQ ID NO: 287 is the determined cDNA sequence of 20320, showing homology to Human 2-phosphopyruvate-hydratase-alpha-enolase

SEQ ID NO: 288 is the determined cDNA sequence of 20321, showing homology to Human E-cadherin

SEQ ID NO: 289 is the determined cDNA sequence of 20322, showing homology to Human hsp86

SEQ ID NO: 290 is the determined cDNA sequence of B828P (20326), showing homology to Human x inactivation transcript

SEQ ID NO: 291 is the determined cDNA sequence of 20333, showing homology to Human chromatin regulator, SMARCA5

SEQ ID NO: 292 is the determined cDNA sequence of 20335, showing homology to Human sphingolipid activator protein 1

SEQ ID NO: 293 is the determined cDNA sequence of 20337, showing homology to Human hepatocyte growth factor activator inhibitor type 2

SEQ ID NO: 294 is the determined cDNA sequence of 20338, showing homology to Human cell adhesion molecule CD44

SEQ ID NO: 295 is the determined cDNA sequence of 20340, showing homology to Human nuclear factor (erythroid-derived)-like 1

SEQ ID NO: 296 is the determined cDNA sequence of 20938, showing homology to Human vinculin mRNA

SEQ ID NO: 297 is the determined cDNA sequence of 20939, showing homology to Human elongation factor EF-1-alpha

SEQ ID NO: 298 is the determined cDNA sequence of 20940, showing homology to Human nestin gene

SEQ ID NO: 299 is the determined cDNA sequence of 20942, showing homology to Human pancreatic ribonuclease

SEQ ID NO: 300 is the determined cDNA sequence of 20943, showing



homology to Human transcobalamin I

SEQ ID NO: 301 is the determined cDNA sequence of 20944, showing homology to Human beta-tubulin

SEQ ID NO: 302 is the determined cDNA sequence of 20946, showing homology to Human HS1 protein

SEQ ID NO: 303 is the determined cDNA sequence of 20947, showing homology to Human cathepsin B

SEQ ID NO: 304 is the determined cDNA sequence of 20948, showing homology to Human testis enhanced gene transcript

SEQ ID NO: 305 is the determined cDNA sequence of 20949, showing homology to Human elongation factor EF-1-alpha

SEQ ID NO: 306 is the determined cDNA sequence of 20950, showing homology to Human ADP-ribosylation factor 3

SEQ ID NO: 307 is the determined cDNA sequence of 20951, showing homology to Human IFP53 or WRS for tryptophanyl-tRNA synthetase

SEQ ID NO: 308 is the determined cDNA sequence of 20952, showing homology to Human cyclin-dependent protein kinase

SEQ ID NO: 308 is the determined cDNA sequence of 20957, showing homology to Human alpha-tubulin sioform 1

SEQ ID NO: 309 is the determined cDNA sequence of 20959, showing homology to Human tyrosine phosphatase-61bp deletion

SEQ ID NO: 310 is the determined cDNA sequence of 20966, showing homology to Human tyrosine phosphatase

SEQ ID NO: 311 is the determined cDNA sequence of B830P (20976), showing homology to Human nuclear factor NF 45

SEQ ID NO: 312 is the determined cDNA sequence of B829P (20977), showing homology to Human delta-6 fatty acid desaturase

SEQ ID NO: 313 is the determined cDNA sequence of 20978, showing homology to Human nuclear aconitase

SEQ ID NO: 314 is the determined cDNA sequence of 19465, showing no significant homology to any known gene.

SEQ ID NO: 315 is the determined cDNA sequence of clone 23176.  
SEQ ID NO: 316 is the determined cDNA sequence of clone 23140.  
SEQ ID NO: 317 is the determined cDNA sequence of clone 23166.  
SEQ ID NO: 318 is the determined cDNA sequence of clone 23167.  
SEQ ID NO: 319 is the determined cDNA sequence of clone 23177.  
SEQ ID NO: 320 is the determined cDNA sequence of clone 23217.  
SEQ ID NO: 321 is the determined cDNA sequence of clone 23169.  
SEQ ID NO: 322 is the determined cDNA sequence of clone 23160.  
SEQ ID NO: 323 is the determined cDNA sequence of clone 23182.  
SEQ ID NO: 324 is the determined cDNA sequence of clone 23232.  
SEQ ID NO: 325 is the determined cDNA sequence of clone 23203.  
SEQ ID NO: 326 is the determined cDNA sequence of clone 23198.  
SEQ ID NO: 327 is the determined cDNA sequence of clone 23224.  
SEQ ID NO: 328 is the determined cDNA sequence of clone 23142.  
SEQ ID NO: 329 is the determined cDNA sequence of clone 23138.  
SEQ ID NO: 330 is the determined cDNA sequence of clone 23147.  
SEQ ID NO: 331 is the determined cDNA sequence of clone 23148.  
SEQ ID NO: 332 is the determined cDNA sequence of clone 23149.  
SEQ ID NO: 333 is the determined cDNA sequence of clone 23172.  
SEQ ID NO: 334 is the determined cDNA sequence of clone 23158.  
SEQ ID NO: 335 is the determined cDNA sequence of clone 23156.  
SEQ ID NO: 336 is the determined cDNA sequence of clone 23221.  
SEQ ID NO: 337 is the determined cDNA sequence of clone 23223.  
SEQ ID NO: 338 is the determined cDNA sequence of clone 23155.  
SEQ ID NO: 339 is the determined cDNA sequence of clone 23225.  
SEQ ID NO: 340 is the determined cDNA sequence of clone 23226.  
SEQ ID NO: 341 is the determined cDNA sequence of clone 23228.  
SEQ ID NO: 342 is the determined cDNA sequence of clone 23229.  
SEQ ID NO: 343 is the determined cDNA sequence of clone 23231.  
SEQ ID NO: 344 is the determined cDNA sequence of clone 23154.  
SEQ ID NO: 345 is the determined cDNA sequence of clone 23157.

SEQ ID NO: 346 is the determined cDNA sequence of clone 23153.  
SEQ ID NO: 347 is the determined cDNA sequence of clone 23159.  
SEQ ID NO: 348 is the determined cDNA sequence of clone 23152.  
SEQ ID NO: 349 is the determined cDNA sequence of clone 23161.  
SEQ ID NO: 350 is the determined cDNA sequence of clone 23162.  
SEQ ID NO: 351 is the determined cDNA sequence of clone 23163.  
SEQ ID NO: 352 is the determined cDNA sequence of clone 23164.  
SEQ ID NO: 353 is the determined cDNA sequence of clone 23165.  
SEQ ID NO: 354 is the determined cDNA sequence of clone 23151.  
SEQ ID NO: 355 is the determined cDNA sequence of clone 23150.  
SEQ ID NO: 356 is the determined cDNA sequence of clone 23168.  
SEQ ID NO: 357 is the determined cDNA sequence of clone 23146.  
SEQ ID NO: 358 is the determined cDNA sequence of clone 23170.  
SEQ ID NO: 359 is the determined cDNA sequence of clone 23171.  
SEQ ID NO: 360 is the determined cDNA sequence of clone 23145.  
SEQ ID NO: 361 is the determined cDNA sequence of clone 23174.  
SEQ ID NO: 362 is the determined cDNA sequence of clone 23175.  
SEQ ID NO: 363 is the determined cDNA sequence of clone 23144.  
SEQ ID NO: 364 is the determined cDNA sequence of clone 23178.  
SEQ ID NO: 365 is the determined cDNA sequence of clone 23179.  
SEQ ID NO: 366 is the determined cDNA sequence of clone 23180.  
SEQ ID NO: 367 is the determined cDNA sequence of clone 23181.  
SEQ ID NO: 368 is the determined cDNA sequence of clone 23143.  
SEQ ID NO: 369 is the determined cDNA sequence of clone 23183.  
SEQ ID NO: 370 is the determined cDNA sequence of clone 23184.  
SEQ ID NO: 371 is the determined cDNA sequence of clone 23185.  
SEQ ID NO: 372 is the determined cDNA sequence of clone 23186.  
SEQ ID NO: 373 is the determined cDNA sequence of clone 23187.  
SEQ ID NO: 374 is the determined cDNA sequence of clone 23190.  
SEQ ID NO: 375 is the determined cDNA sequence of clone 23189.  
SEQ ID NO: 376 is the determined cDNA sequence of clone 23202.

SEQ ID NO: 378 is the determined cDNA sequence of clone 23191.  
SEQ ID NO: 379 is the determined cDNA sequence of clone 23188.  
SEQ ID NO: 380 is the determined cDNA sequence of clone 23194.  
SEQ ID NO: 381 is the determined cDNA sequence of clone 23196.  
SEQ ID NO: 382 is the determined cDNA sequence of clone 23195.  
SEQ ID NO: 383 is the determined cDNA sequence of clone 23193.  
SEQ ID NO: 384 is the determined cDNA sequence of clone 23199.  
SEQ ID NO: 385 is the determined cDNA sequence of clone 23200.  
SEQ ID NO: 386 is the determined cDNA sequence of clone 23192.  
SEQ ID NO: 387 is the determined cDNA sequence of clone 23201.  
SEQ ID NO: 388 is the determined cDNA sequence of clone 23141.  
SEQ ID NO: 389 is the determined cDNA sequence of clone 23139.  
SEQ ID NO: 390 is the determined cDNA sequence of clone 23204.  
SEQ ID NO: 391 is the determined cDNA sequence of clone 23205.  
SEQ ID NO: 392 is the determined cDNA sequence of clone 23206.  
SEQ ID NO: 393 is the determined cDNA sequence of clone 23207.  
SEQ ID NO: 394 is the determined cDNA sequence of clone 23208.  
SEQ ID NO: 395 is the determined cDNA sequence of clone 23209.  
SEQ ID NO: 396 is the determined cDNA sequence of clone 23210.  
SEQ ID NO: 397 is the determined cDNA sequence of clone 23211.  
SEQ ID NO: 398 is the determined cDNA sequence of clone 23212.  
SEQ ID NO: 399 is the determined cDNA sequence of clone 23214.  
SEQ ID NO: 400 is the determined cDNA sequence of clone 23215.  
SEQ ID NO: 401 is the determined cDNA sequence of clone 23216.  
SEQ ID NO: 402 is the determined cDNA sequence of clone 23137.  
SEQ ID NO: 403 is the determined cDNA sequence of clone 23218.  
SEQ ID NO: 404 is the determined cDNA sequence of clone 23220.  
SEQ ID NO: 405 is the determined cDNA sequence of clone 19462.  
SEQ ID NO: 406 is the determined cDNA sequence of clone 19430.  
SEQ ID NO: 407 is the determined cDNA sequence of clone 19407.  
SEQ ID NO: 408 is the determined cDNA sequence of clone 19448.

SEQ ID NO: 409 is the determined cDNA sequence of clone 19447.  
SEQ ID NO: 410 is the determined cDNA sequence of clone 19426.  
SEQ ID NO: 411 is the determined cDNA sequence of clone 19441.  
SEQ ID NO: 412 is the determined cDNA sequence of clone 19454.  
SEQ ID NO: 413 is the determined cDNA sequence of clone 19463.  
SEQ ID NO: 414 is the determined cDNA sequence of clone 19419.  
SEQ ID NO: 415 is the determined cDNA sequence of clone 19434.  
SEQ ID NO: 416 is the determined extended cDNA sequence of B820P.  
SEQ ID NO: 417 is the determined extended cDNA sequence of B821P.  
SEQ ID NO: 418 is the determined extended cDNA sequence of B822P.  
SEQ ID NO: 419 is the determined extended cDNA sequence of B823P.  
SEQ ID NO: 420 is the determined extended cDNA sequence of B824P.  
SEQ ID NO: 421 is the determined extended cDNA sequence of B825P.  
SEQ ID NO: 422 is the determined extended cDNA sequence of B826P.  
SEQ ID NO: 423 is the determined extended cDNA sequence of B827P.  
SEQ ID NO: 424 is the determined extended cDNA sequence of B828P.  
SEQ ID NO: 425 is the determined extended cDNA sequence of B829P.  
SEQ ID NO: 426 is the determined extended cDNA sequence of B830P.  
SEQ ID NO: 427 is the determined cDNA sequence of clone 266B4.  
SEQ ID NO: 428 is the determined cDNA sequence of clone 22892.  
SEQ ID NO: 429 is the determined cDNA sequence of clone 266G3.  
SEQ ID NO: 430 is the determined cDNA sequence of clone 22890.  
SEQ ID NO: 431 is the determined cDNA sequence of clone 264B4.  
SEQ ID NO: 432 is the determined cDNA sequence of clone 22883.  
SEQ ID NO: 433 is the determined cDNA sequence of clone 22882.  
SEQ ID NO: 434 is the determined cDNA sequence of clone 22880.  
SEQ ID NO: 435 is the determined cDNA sequence of clone 263G1.  
SEQ ID NO: 436 is the determined cDNA sequence of clone 263G6.  
SEQ ID NO: 437 is the determined cDNA sequence of clone 262B2.  
SEQ ID NO: 438 is the determined cDNA sequence of clone 262B6.  
SEQ ID NO: 439 is the determined cDNA sequence of clone 22869.

SEQ ID NO: 440 is the determined cDNA sequence of clone 21374.  
SEQ ID NO: 441 is the determined cDNA sequence of clone 21362.  
SEQ ID NO: 442 is the determined cDNA sequence of clone 21349.  
SEQ ID NO: 443 is the determined cDNA sequence of clone 21309.  
SEQ ID NO: 444 is the determined cDNA sequence of clone 21097.  
SEQ ID NO: 445 is the determined cDNA sequence of clone 21096.  
SEQ ID NO: 446 is the determined cDNA sequence of clone 21094.  
SEQ ID NO: 447 is the determined cDNA sequence of clone 21093.  
SEQ ID NO: 448 is the determined cDNA sequence of clone 21091.  
SEQ ID NO: 449 is the determined cDNA sequence of clone 21089.  
SEQ ID NO: 450 is the determined cDNA sequence of clone 21087.  
SEQ ID NO: 451 is the determined cDNA sequence of clone 21085.  
SEQ ID NO: 452 is the determined cDNA sequence of clone 21084.  
SEQ ID NO: 453 is a first partial cDNA sequence of clone 2BT1-40.  
SEQ ID NO: 454 is a second partial cDNA sequence of clone 2BT1-40.  
SEQ ID NO: 455 is the determined cDNA sequence of clone 21063.  
SEQ ID NO: 456 is the determined cDNA sequence of clone 21062.  
SEQ ID NO: 457 is the determined cDNA sequence of clone 21060.  
SEQ ID NO: 458 is the determined cDNA sequence of clone 21053.  
SEQ ID NO: 459 is the determined cDNA sequence of clone 21050.  
SEQ ID NO: 460 is the determined cDNA sequence of clone 21036.  
SEQ ID NO: 461 is the determined cDNA sequence of clone 21037.  
SEQ ID NO: 462 is the determined cDNA sequence of clone 21048.

SEQ ID NO: 463 is a consensus DNA sequence of B726P (referred to as B726P-spliced\_seq\_B726P).

SEQ ID NO: 464 is the determined cDNA sequence of a second splice form of B726P (referred to as 27490.seq\_B726P).

SEQ ID NO: 465 is the determined cDNA sequence of a third splice form of B726P (referred to as 27068.seq\_B726P).

SEQ ID NO: 466 is the determined cDNA sequence of a second splice form of B726P (referred to as 23113.seq\_B726P).

SEQ ID NO: 467 is the determined cDNA sequence of a second splice form of B726P (referred to as 23103.seq\_B726P).

SEQ ID NO: 468 is the determined cDNA sequence of a second splice form of B726P (referred to as 19310.seq\_B726P).

SEQ ID NO: 469 is the predicted amino acid sequence encoded by the upstream ORF of SEQ ID NO: 463.

SEQ ID NO: 470 is the predicted amino acid sequence encoded by SEQ ID NO: 464.

SEQ ID NO: 471 is the predicted amino acid sequence encoded by SEQ ID NO: 465.

SEQ ID NO: 472 is the predicted amino acid sequence encoded by SEQ ID NO: 466.

SEQ ID NO: 473 is the predicted amino acid sequence encoded by SEQ ID NO: 467.

#### DETAILED DESCRIPTION OF THE INVENTION

As noted above, the present invention is generally directed to compositions and methods for the therapy and diagnosis of cancer, such as breast cancer. The compositions described herein may include breast tumor polypeptides, polynucleotides encoding such polypeptides, binding agents such as antibodies, antigen presenting cells (APCs) and/or immune system cells (*e.g.*, T cells). Polypeptides of the present invention generally comprise at least a portion (such as an immunogenic portion) of a breast tumor protein or a variant thereof. A "breast tumor protein" is a protein that is expressed in breast tumor cells at a level that is at least two fold, and preferably at least five fold, greater than the level of expression in a normal tissue, as determined using a representative assay provided herein. Certain breast tumor proteins are tumor proteins that react detectably (within an immunoassay, such as an ELISA or Western blot) with antisera of a patient afflicted with breast cancer. Polynucleotides of the subject invention generally comprise a DNA or RNA sequence that encodes all or a portion of such a polypeptide, or that is complementary to such a sequence. Antibodies are generally immune system proteins, or antigen-binding fragments thereof, that are capable of

binding to a polypeptide as described above. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B-cells that express a polypeptide as described above. T cells that may be employed within such compositions are generally T cells that are specific for a polypeptide as described above.

The present invention is based on the discovery of human breast tumor proteins. Sequences of polynucleotides encoding specific tumor proteins are provided in SEQ ID NOS:1-175, 178, 180 and 182-468.

#### BREAST TUMOR PROTEIN POLYNUCLEOTIDES

Any polynucleotide that encodes a breast tumor protein or a portion or other variant thereof as described herein is encompassed by the present invention. Preferred polynucleotides comprise at least 15 consecutive nucleotides, preferably at least 30 consecutive nucleotides and more preferably at least 45 consecutive nucleotides, that encode a portion of a breast tumor protein. More preferably, a polynucleotide encodes an immunogenic portion of a breast tumor protein. Polynucleotides complementary to any such sequences are also encompassed by the present invention. Polynucleotides may be single-stranded (coding or antisense) or double-stranded, and may be DNA (genomic, cDNA or synthetic) or RNA molecules. RNA molecules include HnRNA molecules, which contain introns and correspond to a DNA molecule in a one-to-one manner, and mRNA molecules, which do not contain introns. Additional coding or non-coding sequences may, but need not, be present within a polynucleotide of the present invention, and a polynucleotide may, but need not, be linked to other molecules and/or support materials.

Polynucleotides may comprise a native sequence (*i.e.*, an endogenous sequence that encodes a breast tumor protein or a portion thereof) or may comprise a variant of such a sequence. Polynucleotide variants may contain one or more substitutions, additions, deletions and/or insertions such that the immunogenicity of the encoded polypeptide is not diminished, relative to a native tumor protein. The effect on the immunogenicity of the encoded polypeptide may generally be assessed as described herein. Variants preferably exhibit at least about 70% identity, more preferably at least about 80% identity and most preferably at least about 90% identity to a polynucleotide



sequence that encodes a native breast tumor protein or a portion thereof. The term "variants" also encompasses homologous genes of xenogenic origin.

Two polynucleotide or polypeptide sequences are said to be "identical" if the sequence of nucleotides or amino acids in the two sequences is the same when aligned for maximum correspondence as described below. Comparisons between two sequences are typically performed by comparing the sequences over a comparison window to identify and compare local regions of sequence similarity. A "comparison window" as used herein, refers to a segment of at least about 20 contiguous positions, usually 30 to about 75, 40 to about 50, in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned.

Optimal alignment of sequences for comparison may be conducted using the Megalign program in the Lasergene suite of bioinformatics software (DNASTAR, Inc., Madison, WI), using default parameters. This program embodies several alignment schemes described in the following references: Dayhoff, M.O. (1978) A model of evolutionary change in proteins – Matrices for detecting distant relationships. In Dayhoff, M.O. (ed.) Atlas of Protein Sequence and Structure, National Biomedical Research Foundation, Washington DC Vol. 5, Suppl. 3, pp. 345-358; Hein J. (1990) Unified Approach to Alignment and Phylogenies pp. 626-645 *Methods in Enzymology* vol. 183, Academic Press, Inc., San Diego, CA; Higgins, D.G. and Sharp, P.M. (1989) *CABIOS* 5:151-153; Myers, E.W. and Muller W. (1988) *CABIOS* 4:11-17; Robinson, E.D. (1971) *Comb. Theor* 11:105; Santou, N. Nes, M. (1987) *Mol. Biol. Evol.* 4:406-425; Sneath, P.H.A. and Sokal, R.R. (1973) *Numerical Taxonomy – the Principles and Practice of Numerical Taxonomy*, Freeman Press, San Francisco, CA; Wilbur, W.J. and Lipman, D.J. (1983) *Proc. Natl. Acad. Sci. USA* 80:726-730.

Preferably, the "percentage of sequence identity" is determined by comparing two optimally aligned sequences over a window of comparison of at least 20 positions, wherein the portion of the polynucleotide or polypeptide sequence in the comparison window may comprise additions or deletions (i.e. gaps) of 20 percent or less, usually 5 to 15 percent, or 10 to 12 percent, as compared to the reference sequences (which does not comprise additions or deletions) for optimal alignment of the two

sequences. The percentage is calculated by determining the number of positions at which the identical nucleic acid bases or amino acid residue occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the total number of positions in the reference sequence (i.e. the window size) and multiplying the results by 100 to yield the percentage of sequence identity.

Variants may also, or alternatively, be substantially homologous to a native gene, or a portion or complement thereof. Such polynucleotide variants are capable of hybridizing under moderately stringent conditions to a naturally occurring DNA sequence encoding a native breast tumor protein (or a complementary sequence). Suitable moderately stringent conditions include prewashing in a solution of 5 X SSC, 0.5% SDS, 1.0 mM EDTA (pH 8.0); hybridizing at 50°C-65°C, 5 X SSC, overnight; followed by washing twice at 65°C for 20 minutes with each of 2X, 0.5X and 0.2X SSC containing 0.1% SDS.

It will be appreciated by those of ordinary skill in the art that, as a result of the degeneracy of the genetic code, there are many nucleotide sequences that encode a polypeptide as described herein. Some of these polynucleotides bear minimal homology to the nucleotide sequence of any native gene. Nonetheless, polynucleotides that vary due to differences in codon usage are specifically contemplated by the present invention. Further, alleles of the genes comprising the polynucleotide sequences provided herein are within the scope of the present invention. Alleles are endogenous genes that are altered as a result of one or more mutations, such as deletions, additions and/or substitutions of nucleotides. The resulting mRNA and protein may, but need not, have an altered structure or function. Alleles may be identified using standard techniques (such as hybridization, amplification and/or database sequence comparison).

Polynucleotides may be prepared using any of a variety of techniques. For example, a polynucleotide may be identified, as described in more detail below, by screening a microarray of cDNAs for tumor-associated expression (i.e., expression that is at least five fold greater in a breast tumor than in normal tissue, as determined using a representative assay provided herein). Such screens may be performed using a Synteni microarray (Palo Alto, CA) according to the manufacturer's instructions (and essentially

as described by Schena et al., *Proc. Natl. Acad. Sci. USA* 93:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad. Sci. USA* 94:2150-2155, 1997). Alternatively, polypeptides may be amplified from cDNA prepared from cells expressing the proteins described herein, such as breast tumor cells. Such polynucleotides may be amplified via polymerase chain reaction (PCR). For this approach, sequence-specific primers may be designed based on the sequences provided herein, and may be purchased or synthesized.

An amplified portion may be used to isolate a full length gene from a suitable library (e.g., a breast tumor cDNA library) using well known techniques. Within such techniques, a library (cDNA or genomic) is screened using one or more polynucleotide probes or primers suitable for amplification. Preferably, a library is size-selected to include larger molecules. Random primed libraries may also be preferred for identifying 5' and upstream regions of genes. Genomic libraries are preferred for obtaining introns and extending 5' sequences.

For hybridization techniques, a partial sequence may be labeled (e.g., by nick-translation or end-labeling with  $^{32}\text{P}$ ) using well known techniques. A bacterial or bacteriophage library is then screened by hybridizing filters containing denatured bacterial colonies (or lawns containing phage plaques) with the labeled probe (see Sambrook et al., *Molecular Cloning: A Laboratory Manual*, Cold Spring Harbor Laboratories, Cold Spring Harbor, NY, 1989). Hybridizing colonies or plaques are selected and expanded, and the DNA is isolated for further analysis. cDNA clones may be analyzed to determine the amount of additional sequence by, for example, PCR using a primer from the partial sequence and a primer from the vector. Restriction maps and partial sequences may be generated to identify one or more overlapping clones. The complete sequence may then be determined using standard techniques, which may involve generating a series of deletion clones. The resulting overlapping sequences are then assembled into a single contiguous sequence. A full length cDNA molecule can be generated by ligating suitable fragments, using well known techniques.

Alternatively, there are numerous amplification techniques for obtaining a full length coding sequence from a partial cDNA sequence. Within such techniques, amplification is generally performed via PCR. Any of a variety of commercially available kits may be used to perform the amplification step. Primers may be designed

using, for example, software well known in the art. Primers are preferably 22-30 nucleotides in length, have a GC content of at least 50% and anneal to the target sequence at temperatures of about 68°C to 72°C. The amplified region may be sequenced as described above, and overlapping sequences assembled into a contiguous sequence.

One such amplification technique is inverse PCR (*see* Triglia et al., *Nucl. Acids Res.* 16:8186, 1988), which uses restriction enzymes to generate a fragment in the known region of the gene. The fragment is then circularized by intramolecular ligation and used as a template for PCR with divergent primers derived from the known region. Within an alternative approach, sequences adjacent to a partial sequence may be retrieved by amplification with a primer to a linker sequence and a primer specific to a known region. The amplified sequences are typically subjected to a second round of amplification with the same linker primer and a second primer specific to the known region. A variation on this procedure, which employs two primers that initiate extension in opposite directions from the known sequence, is described in WO 96/38591. Another such technique is known as "rapid amplification of cDNA ends" or RACE. This technique involves the use of an internal primer and an external primer, which hybridizes to a polyA region or vector sequence, to identify sequences that are 5' and 3' of a known sequence. Additional techniques include capture PCR (Lagerstrom et al., *PCR Methods Applic.* 1:111-19, 1991) and walking PCR (Parker et al., *Nucl. Acids. Res.* 19:3055-60, 1991). Other methods employing amplification may also be employed to obtain a full length cDNA sequence.

In certain instances, it is possible to obtain a full length cDNA sequence by analysis of sequences provided in an expressed sequence tag (EST) database, such as that available from GenBank. Searches for overlapping ESTs may generally be performed using well known programs (*e.g.*, NCBI BLAST searches), and such ESTs may be used to generate a contiguous full length sequence. Full length DNA sequences may also be obtained by analysis of genomic fragments.

Certain nucleic acid sequences of cDNA molecules encoding portions of breast tumor proteins are provided in SEQ ID NO: 1-175, 178, 180 and 182-468. The

isolation of these sequences is described in detail below.

Polynucleotide variants may generally be prepared by any method known in the art, including chemical synthesis by, for example, solid phase phosphoramidite chemical synthesis. Modifications in a polynucleotide sequence may also be introduced using standard mutagenesis techniques, such as oligonucleotide-directed site-specific mutagenesis (*see* Adelman et al., *DNA* 2:183, 1983). Alternatively, RNA molecules may be generated by *in vitro* or *in vivo* transcription of DNA sequences encoding a breast tumor protein, or portion thereof, provided that the DNA is incorporated into a vector with a suitable RNA polymerase promoter (such as T7 or SP6). Certain portions may be used to prepare an encoded polypeptide, as described herein. In addition, or alternatively, a portion may be administered to a patient such that the encoded polypeptide is generated *in vivo* (*e.g.*, by transfecting antigen-presenting cells, such as dendritic cells, with a cDNA construct encoding a breast tumor polypeptide, and administering the transfected cells to the patient).

A portion of a sequence complementary to a coding sequence (*i.e.*, an antisense polynucleotide) may also be used as a probe or to modulate gene expression. cDNA constructs that can be transcribed into antisense RNA may also be introduced into cells of tissues to facilitate the production of antisense RNA. An antisense polynucleotide may be used, as described herein, to inhibit expression of a tumor protein. Antisense technology can be used to control gene expression through triple-helix formation, which compromises the ability of the double helix to open sufficiently for the binding of polymerases, transcription factors or regulatory molecules (*see* Gee et al., *In Huber and Carr, Molecular and Immunologic Approaches*, Futura Publishing Co. (Mt. Kisco, NY; 1994)). Alternatively, an antisense molecule may be designed to hybridize with a control region of a gene (*e.g.*, promoter, enhancer or transcription initiation site), and block transcription of the gene; or to block translation by inhibiting binding of a transcript to ribosomes.

A portion of a coding sequence, or of a complementary sequence, may also be designed as a probe or primer to detect gene expression. Probes may be labeled with a variety of reporter groups, such as radionuclides and enzymes, and are preferably at least 10 nucleotides in length, more preferably at least 20 nucleotides in length and

still more preferably at least 30 nucleotides in length. Primers, as noted above, are preferably 22-30 nucleotides in length.

Any polynucleotide may be further modified to increase stability *in vivo*. Possible modifications include, but are not limited to, the addition of flanking sequences at the 5' and/or 3' ends; the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages in the backbone; and/or the inclusion of nontraditional bases such as inosine, queosine and wybutosine, as well as acetyl-, methyl-, thio- and other modified forms of adenine, cytidine, guanine, thymine and uridine.

Nucleotide sequences as described herein may be joined to a variety of other nucleotide sequences using established recombinant DNA techniques. For example, a polynucleotide may be cloned into any of a variety of cloning vectors, including plasmids, phagemids, lambda phage derivatives and cosmids. Vectors of particular interest include expression vectors, replication vectors, probe generation vectors and sequencing vectors. In general, a vector will contain an origin of replication functional in at least one organism, convenient restriction endonuclease sites and one or more selectable markers. Other elements will depend upon the desired use, and will be apparent to those of ordinary skill in the art.

Within certain embodiments, polynucleotides may be formulated so as to permit entry into a cell of a mammal, and expression therein. Such formulations are particularly useful for therapeutic purposes, as described below. Those of ordinary skill in the art will appreciate that there are many ways to achieve expression of a polynucleotide in a target cell, and any suitable method may be employed. For example, a polynucleotide may be incorporated into a viral vector such as, but not limited to, adenovirus, adeno-associated virus, retrovirus, or vaccinia or other pox virus (*e.g.*, avian pox virus). The polynucleotides may also be administered as naked plasmid vectors. Techniques for incorporating DNA into such vectors are well known to those of ordinary skill in the art. A retroviral vector may additionally transfer or incorporate a gene for a selectable marker (to aid in the identification or selection of transduced cells) and/or a targeting moiety, such as a gene that encodes a ligand for a receptor on a specific target cell, to render the vector target specific. Targeting may also be accomplished using an antibody, by methods known to those of ordinary skill in the art.

Other formulations for therapeutic purposes include colloidal dispersion systems, such as macromolecule complexes, nanocapsules, microspheres, beads, and lipid-based systems including oil-in-water emulsions, micelles, mixed micelles, and liposomes. A preferred colloidal system for use as a delivery vehicle *in vitro* and *in vivo* is a liposome (*i.e.*, an artificial membrane vesicle). The preparation and use of such systems is well known in the art.

#### BREAST TUMOR POLYPEPTIDES

Within the context of the present invention, polypeptides may comprise at least an immunogenic portion of a breast tumor protein or a variant thereof, as described herein. As noted above, a "breast tumor protein" is a protein that is expressed by breast tumor cells. Proteins that are breast tumor proteins also react detectably within an immunoassay (such as an ELISA) with antisera from a patient with breast cancer. Polypeptides as described herein may be of any length. Additional sequences derived from the native protein and/or heterologous sequences may be present, and such sequences may (but need not) possess further immunogenic or antigenic properties.

An "immunogenic portion," as used herein is a portion of a protein that is

recognized (*i.e.*, specifically bound) by a B-cell and/or T-cell surface antigen receptor. Such immunogenic portions generally comprise at least 5 amino acid residues, more preferably at least 10, and still more preferably at least 20 amino acid residues of a breast tumor protein or a variant thereof. Certain preferred immunogenic portions include peptides in which an N-terminal leader sequence and/or transmembrane domain have been deleted. Other preferred immunogenic portions may contain a small N- and/or C-terminal deletion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids), relative to the mature protein.

Immunogenic portions may generally be identified using well known techniques, such as those summarized in Paul, *Fundamental Immunology*, 3rd ed., 243-247 (Raven Press, 1993) and references cited therein. Such techniques include screening polypeptides for the ability to react with antigen-specific antibodies, antisera and/or T-cell lines or clones. As used herein, antisera and antibodies are "antigen-specific" if they specifically bind to an antigen (*i.e.*, they react with the protein in an ELISA or other immunoassay, and do not react detectably with unrelated proteins). Such antisera and antibodies may be prepared as described herein, and using well known techniques. An immunogenic portion of a native breast tumor protein is a portion that reacts with such antisera and/or T-cells at a level that is not substantially less than the reactivity of the full length polypeptide (*e.g.*, in an ELISA and/or T-cell reactivity assay). Such immunogenic portions may react within such assays at a level that is similar to or greater than the reactivity of the full length polypeptide. Such screens may generally be performed using methods well known to those of ordinary skill in the art, such as those described in Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. For example, a polypeptide may be immobilized on a solid support and contacted with patient sera to allow binding of antibodies within the sera to the immobilized polypeptide. Unbound sera may then be removed and bound antibodies detected using, for example, <sup>125</sup>I-labeled Protein A.

As noted above, a composition may comprise a variant of a native breast tumor protein. A polypeptide "variant," as used herein, is a polypeptide that differs from a native breast tumor protein in one or more substitutions, deletions, additions and/or insertions, such that the immunogenicity of the polypeptide is not substantially



diminished. In other words, the ability of a variant to react with antigen-specific antisera may be enhanced or unchanged, relative to the native protein, or may be diminished by less than 50%, and preferably less than 20%, relative to the native protein. Such variants may generally be identified by modifying one of the above polypeptide sequences and evaluating the reactivity of the modified polypeptide with antigen-specific antibodies or antisera as described herein. Preferred variants include those in which one or more portions, such as an N-terminal leader sequence or transmembrane domain, have been removed. Other preferred variants include variants in which a small portion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids) has been removed from the N- and/or C-terminal of the mature protein.

Polypeptide variants preferably exhibit at least about 70%, more preferably at least about 90% and most preferably at least about 95% identity (determined as described above) to the identified polypeptides.

Preferably, a variant contains conservative substitutions. A "conservative substitution" is one in which an amino acid is substituted for another amino acid that has similar properties, such that one skilled in the art of peptide chemistry would expect the secondary structure and hydropathic nature of the polypeptide to be substantially unchanged. Amino acid substitutions may generally be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity and/or the amphipathic nature of the residues. For example, negatively charged amino acids include aspartic acid and glutamic acid; positively charged amino acids include lysine and arginine; and amino acids with uncharged polar head groups having similar hydrophilicity values include leucine, isoleucine and valine; glycine and alanine; asparagine and glutamine; and serine, threonine, phenylalanine and tyrosine. Other groups of amino acids that may represent conservative changes include: (1) ala, pro, gly, glu, asp, gln, asn, ser, thr; (2) cys, ser, tyr, thr; (3) val, ile, leu, met, ala, phe; (4) lys, arg, his; and (5) phe, tyr, trp, his. A variant may also, or alternatively, contain nonconservative changes. In a preferred embodiment, variant polypeptides differ from a native sequence by substitution, deletion or addition of five amino acids or fewer. Variants may also (or alternatively) be modified by, for example, the deletion or addition of amino acids that have minimal influence on the immunogenicity, secondary structure and hydropathic nature of the polypeptide.

As noted above, polypeptides may comprise a signal (or leader) sequence at the N-terminal end of the protein which co-translationally or post-translationally directs transfer of the protein. The polypeptide may also be conjugated to a linker or other sequence for ease of synthesis, purification or identification of the polypeptide (e.g., poly-His), or to enhance binding of the polypeptide to a solid support. For example, a polypeptide may be conjugated to an immunoglobulin Fc region.

Polypeptides may be prepared using any of a variety of well known techniques. Recombinant polypeptides encoded by DNA sequences as described above may be readily prepared from the DNA sequences using any of a variety of expression vectors known to those of ordinary skill in the art. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector containing a DNA molecule that encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast, higher eukaryotic and plant cells. Preferably, the host cells employed are *E. coli*, yeast or a mammalian cell line such as COS or CHO. Supernatants from suitable host/vector systems which secrete recombinant protein or polypeptide into culture media may be first concentrated using a commercially available filter. Following concentration, the concentrate may be applied to a suitable purification matrix such as an affinity matrix or an ion exchange resin. Finally, one or more reverse phase HPLC steps can be employed to further purify a recombinant polypeptide.

Portions and other variants having fewer than about 100 amino acids, and generally fewer than about 50 amino acids, may also be generated by synthetic means, using techniques well known to those of ordinary skill in the art. For example, such polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. See Merrifield, *J. Am. Chem. Soc.* 85:2149-2146, 1963. Equipment for automated synthesis of polypeptides is commercially available from suppliers such as Perkin Elmer/Applied BioSystems Division (Foster City, CA), and may be operated according to the manufacturer's instructions.

Within certain specific embodiments, a polypeptide may be a fusion protein that comprises multiple polypeptides as described herein, or that comprises at

least one polypeptide as described herein and an unrelated sequence, such as a known tumor protein. A fusion partner may, for example, assist in providing T helper epitopes (an immunological fusion partner), preferably T helper epitopes recognized by humans, or may assist in expressing the protein (an expression enhancer) at higher yields than the native recombinant protein. Certain preferred fusion partners are both immunological and expression enhancing fusion partners. Other fusion partners may be selected so as to increase the solubility of the protein or to enable the protein to be targeted to desired intracellular compartments. Still further fusion partners include affinity tags, which facilitate purification of the protein.

Fusion proteins may generally be prepared using standard techniques, including chemical conjugation. Preferably, a fusion protein is expressed as a recombinant protein, allowing the production of increased levels, relative to a non-fused protein, in an expression system. Briefly, DNA sequences encoding the polypeptide components may be assembled separately, and ligated into an appropriate expression vector. The 3' end of the DNA sequence encoding one polypeptide component is ligated, with or without a peptide linker, to the 5' end of a DNA sequence encoding the second polypeptide component so that the reading frames of the sequences are in phase. This permits translation into a single fusion protein that retains the biological activity of both component polypeptides.

A peptide linker sequence may be employed to separate the first and the second polypeptide components by a distance sufficient to ensure that each polypeptide folds into its secondary and tertiary structures. Such a peptide linker sequence is incorporated into the fusion protein using standard techniques well known in the art. Suitable peptide linker sequences may be chosen based on the following factors: (1) their ability to adopt a flexible extended conformation; (2) their inability to adopt a secondary structure that could interact with functional epitopes on the first and second polypeptides; and (3) the lack of hydrophobic or charged residues that might react with the polypeptide functional epitopes. Preferred peptide linker sequences contain Gly, Asn and Ser residues. Other near neutral amino acids, such as Thr and Ala may also be used in the linker sequence. Amino acid sequences which may be usefully employed as linkers include those disclosed in Maratea et al., *Gene* 40:39-46, 1985; Murphy et al.,

*Proc. Natl. Acad. Sci. USA* 83:8258-8262, 1986; U.S. Patent No. 4,935,233 and U.S. Patent No. 4,751,180. The linker sequence may generally be from 1 to about 50 amino acids in length. Linker sequences are not required when the first and second polypeptides have non-essential N-terminal amino acid regions that can be used to separate the functional domains and prevent steric interference.

The ligated DNA sequences are operably linked to suitable transcriptional or translational regulatory elements. The regulatory elements responsible for expression of DNA are located only 5' to the DNA sequence encoding the first polypeptides. Similarly, stop codons required to end translation and transcription termination signals are only present 3' to the DNA sequence encoding the second polypeptide.

Fusion proteins are also provided that comprise a polypeptide of the present invention together with an unrelated immunogenic protein. Preferably the immunogenic protein is capable of eliciting a recall response. Examples of such proteins include tetanus, tuberculosis and hepatitis proteins (*see, for example, Stoute et al. New Engl. J. Med.*, 336:86-91, 1997).

Within preferred embodiments, an immunological fusion partner is derived from protein D, a surface protein of the gram-negative bacterium *Haemophilus influenza B* (WO 91/18926). Preferably, a protein D derivative comprises approximately the first third of the protein (*e.g.*, the first N-terminal 100-110 amino acids), and a protein D derivative may be lipidated. Within certain preferred embodiments, the first 109 residues of a Lipoprotein D fusion partner is included on the N-terminus to provide the polypeptide with additional exogenous T-cell epitopes and to increase the expression level in *E. coli* (thus functioning as an expression enhancer). The lipid tail ensures optimal presentation of the antigen to antigen presenting cells. Other fusion partners include the non-structural protein from influenzae virus, NS1 (hemagglutinin). Typically, the N-terminal 81 amino acids are used, although different fragments that include T-helper epitopes may be used.

In another embodiment, the immunological fusion partner is the protein known as LYTA, or a portion thereof (preferably a C-terminal portion). LYTA is derived from *Streptococcus pneumoniae*, which synthesizes an N-acetyl-L-alanine amidase known as amidase LYTA (encoded by the *LytA* gene; *Gene* 43:265-292, 1986).

LYTA is an autolysin that specifically degrades certain bonds in the peptidoglycan backbone. The C-terminal domain of the LYTA protein is responsible for the affinity to the choline or to some choline analogues such as DEAE. This property has been exploited for the development of *E. coli* C-LYTA expressing plasmids useful for expression of fusion proteins. Purification of hybrid proteins containing the C-LYTA fragment at the amino terminus has been described (see *Biotechnology* 10:795-798, 1992). Within a preferred embodiment, a repeat portion of LYTA may be incorporated into a fusion protein. A repeat portion is found in the C-terminal region starting at residue 178. A particularly preferred repeat portion incorporates residues 188-305.

In general, polypeptides (including fusion proteins) and polynucleotides as described herein are isolated. An "isolated" polypeptide or polynucleotide is one that is removed from its original environment. For example, a naturally-occurring protein is isolated if it is separated from some or all of the coexisting materials in the natural system. Preferably, such polypeptides are at least about 90% pure, more preferably at least about 95% pure and most preferably at least about 99% pure. A polynucleotide is considered to be isolated if, for example, it is cloned into a vector that is not a part of the natural environment.

#### BINDING AGENTS

The present invention further provides agents, such as antibodies and antigen-binding fragments thereof, that specifically bind to a breast tumor protein. As used herein, an antibody, or antigen-binding fragment thereof, is said to "specifically bind" to a breast tumor protein if it reacts at a detectable level (within, for example, an ELISA) with a breast tumor protein, and does not react detectably with unrelated proteins under similar conditions. As used herein, "binding" refers to a noncovalent association between two separate molecules such that a complex is formed. The ability to bind may be evaluated by, for example, determining a binding constant for the formation of the complex. The binding constant is the value obtained when the concentration of the complex is divided by the product of the component concentrations. In general, two compounds are said to "bind," in the context of the present invention, when the binding constant for complex formation exceeds about  $10^3$  L/mol. The binding constant may be

determined using methods well known in the art.

Binding agents may be further capable of differentiating between patients with and without a cancer, such as breast cancer, using the representative assays provided herein. In other words, antibodies or other binding agents that bind to a breast tumor protein will generate a signal indicating the presence of a cancer in at least about 20% of patients with the disease, and will generate a negative signal indicating the absence of the disease in at least about 90% of individuals without the cancer. To determine whether a binding agent satisfies this requirement, biological samples (*e.g.*, blood, sera, urine and/or tumor biopsies) from patients with and without a cancer (as determined using standard clinical tests) may be assayed as described herein for the presence of polypeptides that bind to the binding agent. It will be apparent that a statistically significant number of samples with and without the disease should be assayed. Each binding agent should satisfy the above criteria; however, those of ordinary skill in the art will recognize that binding agents may be used in combination to improve sensitivity.

Any agent that satisfies the above requirements may be a binding agent. For example, a binding agent may be a ribosome, with or without a peptide component, an RNA molecule or a polypeptide. In a preferred embodiment, a binding agent is an antibody or an antigen-binding fragment thereof. Antibodies may be prepared by any of a variety of techniques known to those of ordinary skill in the art. *See, e.g.*, Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, antibodies can be produced by cell culture techniques, including the generation of monoclonal antibodies as described herein, or via transfection of antibody genes into suitable bacterial or mammalian cell hosts, in order to allow for the production of recombinant antibodies. In one technique, an immunogen comprising the polypeptide is initially injected into any of a wide variety of mammals (*e.g.*, mice, rats, rabbits, sheep or goats). In this step, the polypeptides of this invention may serve as the immunogen without modification. Alternatively, particularly for relatively short polypeptides, a superior immune response may be elicited if the polypeptide is joined to a carrier protein, such as bovine serum albumin or keyhole limpet hemocyanin. The immunogen is injected into the animal host, preferably according to a predetermined schedule incorporating one or more booster immunizations, and the animals are bled periodically.

Polyclonal antibodies specific for the polypeptide may then be purified from such antisera by, for example, affinity chromatography using the polypeptide coupled to a suitable solid support.

Monoclonal antibodies specific for an antigenic polypeptide of interest may be prepared, for example, using the technique of Kohler and Milstein, *Eur. J. Immunol.* 6:511-519, 1976, and improvements thereto. Briefly, these methods involve the preparation of immortal cell lines capable of producing antibodies having the desired specificity (*i.e.*, reactivity with the polypeptide of interest). Such cell lines may be produced, for example, from spleen cells obtained from an animal immunized as described above. The spleen cells are then immortalized by, for example, fusion with a myeloma cell fusion partner, preferably one that is syngeneic with the immunized animal. A variety of fusion techniques may be employed. For example, the spleen cells and myeloma cells may be combined with a nonionic detergent for a few minutes and then plated at low density on a selective medium that supports the growth of hybrid cells, but not myeloma cells. A preferred selection technique uses HAT (hypoxanthine, aminopterin, thymidine) selection. After a sufficient time, usually about 1 to 2 weeks, colonies of hybrids are observed. Single colonies are selected and their culture supernatants tested for binding activity against the polypeptide. Hybridomas having high reactivity and specificity are preferred.

Monoclonal antibodies may be isolated from the supernatants of growing hybridoma colonies. In addition, various techniques may be employed to enhance the yield, such as injection of the hybridoma cell line into the peritoneal cavity of a suitable vertebrate host, such as a mouse. Monoclonal antibodies may then be harvested from the ascites fluid or the blood. Contaminants may be removed from the antibodies by conventional techniques, such as chromatography, gel filtration, precipitation, and extraction. The polypeptides of this invention may be used in the purification process in, for example, an affinity chromatography step.

Within certain embodiments, the use of antigen-binding fragments of antibodies may be preferred. Such fragments include Fab fragments, which may be prepared using standard techniques. Briefly, immunoglobulins may be purified from rabbit serum by affinity chromatography on Protein A bead columns (Harlow and Lane,

*Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988) and digested by papain to yield Fab and Fc fragments. The Fab and Fc fragments may be separated by affinity chromatography on protein A bead columns.

Monoclonal antibodies of the present invention may be coupled to one or more therapeutic agents. Suitable agents in this regard include radionuclides, differentiation inducers, drugs, toxins, and derivatives thereof. Preferred radionuclides include  $^{90}\text{Y}$ ,  $^{123}\text{I}$ ,  $^{125}\text{I}$ ,  $^{131}\text{I}$ ,  $^{186}\text{Re}$ ,  $^{188}\text{Re}$ ,  $^{211}\text{At}$ , and  $^{212}\text{Bi}$ . Preferred drugs include methotrexate, and pyrimidine and purine analogs. Preferred differentiation inducers include phorbol esters and butyric acid. Preferred toxins include ricin, abrin, diphtheria toxin, cholera toxin, gelonin, *Pseudomonas* exotoxin, *Shigella* toxin, and pokeweed antiviral protein.

A therapeutic agent may be coupled (*e.g.*, covalently bonded) to a suitable monoclonal antibody either directly or indirectly (*e.g.*, via a linker group). A direct reaction between an agent and an antibody is possible when each possesses a substituent capable of reacting with the other. For example, a nucleophilic group, such as an amino or sulfhydryl group, on one may be capable of reacting with a carbonyl-containing group, such as an anhydride or an acid halide, or with an alkyl group containing a good leaving group (*e.g.*, a halide) on the other.

Alternatively, it may be desirable to couple a therapeutic agent and an antibody via a linker group. A linker group can function as a spacer to distance an antibody from an agent in order to avoid interference with binding capabilities. A linker group can also serve to increase the chemical reactivity of a substituent on an agent or an antibody, and thus increase the coupling efficiency. An increase in chemical reactivity may also facilitate the use of agents, or functional groups on agents, which otherwise would not be possible.

It will be evident to those skilled in the art that a variety of bifunctional or polyfunctional reagents, both homo- and hetero-functional (such as those described in the catalog of the Pierce Chemical Co., Rockford, IL), may be employed as the linker group. Coupling may be effected, for example, through amino groups, carboxyl groups, sulfhydryl groups or oxidized carbohydrate residues. There are numerous references describing such methodology, *e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.



Where a therapeutic agent is more potent when free from the antibody portion of the immunoconjugates of the present invention, it may be desirable to use a linker group which is cleavable during or upon internalization into a cell. A number of different cleavable linker groups have been described. The mechanisms for the intracellular release of an agent from these linker groups include cleavage by reduction of a disulfide bond (*e.g.*, U.S. Patent No. 4,489,710, to Spitler), by irradiation of a photolabile bond (*e.g.*, U.S. Patent No. 4,625,014, to Senter et al.), by hydrolysis of derivatized amino acid side chains (*e.g.*, U.S. Patent No. 4,638,045, to Kohn et al.), by serum complement-mediated hydrolysis (*e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.), and acid-catalyzed hydrolysis (*e.g.*, U.S. Patent No. 4,569,789, to Blattler et al.).

It may be desirable to couple more than one agent to an antibody. In one embodiment, multiple molecules of an agent are coupled to one antibody molecule. In another embodiment, more than one type of agent may be coupled to one antibody. Regardless of the particular embodiment, immunoconjugates with more than one agent may be prepared in a variety of ways. For example, more than one agent may be coupled directly to an antibody molecule, or linkers which provide multiple sites for attachment can be used. Alternatively, a carrier can be used.

A carrier may bear the agents in a variety of ways, including covalent bonding either directly or via a linker group. Suitable carriers include proteins such as albumins (*e.g.*, U.S. Patent No. 4,507,234, to Kato et al.), peptides and polysaccharides such as aminodextran (*e.g.*, U.S. Patent No. 4,699,784, to Shih et al.). A carrier may also bear an agent by noncovalent bonding or by encapsulation, such as within a liposome vesicle (*e.g.*, U.S. Patent Nos. 4,429,008 and 4,873,088). Carriers specific for radionuclide agents include radiohalogenated small molecules and chelating compounds. For example, U.S. Patent No. 4,735,792 discloses representative radiohalogenated small molecules and their synthesis. A radionuclide chelate may be formed from chelating compounds that include those containing nitrogen and sulfur atoms as the donor atoms for binding the metal, or metal oxide, radionuclide. For example, U.S. Patent No. 4,673,562, to Davison et al. discloses representative chelating compounds and their synthesis.

A variety of routes of administration for the antibodies and

immunoconjugates may be used. Typically, administration will be intravenous, intramuscular, subcutaneous or in the bed of a resected tumor. It will be evident that the precise dose of the antibody/immunoconjugate will vary depending upon the antibody used, the antigen density on the tumor, and the rate of clearance of the antibody.

### T CELLS

Immunotherapeutic compositions may also, or alternatively, comprise T cells specific for a breast tumor protein. Such cells may generally be prepared *in vitro* or *ex vivo*, using standard procedures. For example, T cells may be isolated from bone marrow, peripheral blood, or a fraction of bone marrow or peripheral blood of a patient, using a commercially available cell separation system, such as the ISOLEX™ system, available from Nexell Therapeutics Inc., Irvine, CA (see also U.S. Patent No. 5,240,856; U.S. Patent No. 5,215,926; WO 89/06280; WO 91/16116 and WO 92/07243). Alternatively, T cells may be derived from related or unrelated humans, non-human mammals, cell lines or cultures.

T cells may be stimulated with a breast tumor polypeptide, polynucleotide encoding a breast tumor polypeptide and/or an antigen presenting cell (APC) that expresses such a polypeptide. Such stimulation is performed under conditions and for a time sufficient to permit the generation of T cells that are specific for the polypeptide. Preferably, a breast tumor polypeptide or polynucleotide is present within a delivery vehicle, such as a microsphere, to facilitate the generation of specific T cells.

T cells are considered to be specific for a breast tumor polypeptide if the T cells kill target cells coated with the polypeptide or expressing a gene encoding the polypeptide. T cell specificity may be evaluated using any of a variety of standard techniques. For example, within a chromium release assay or proliferation assay, a stimulation index of more than two fold increase in lysis and/or proliferation, compared to negative controls, indicates T cell specificity. Such assays may be performed, for example, as described in Chen et al., *Cancer Res.* 54:1065-1070, 1994. Alternatively, detection of the proliferation of T cells may be accomplished by a variety of known techniques. For example, T cell proliferation can be detected by measuring an increased

rate of DNA synthesis (*e.g.*, by pulse-labeling cultures of T cells with tritiated thymidine and measuring the amount of tritiated thymidine incorporated into DNA). Contact with a breast tumor polypeptide (100 ng/ml - 100 µg/ml, preferably 200 ng/ml - 25 µg/ml) for 3 - 7 days should result in at least a two fold increase in proliferation of the T cells. Contact as described above for 2-3 hours should result in activation of the T cells, as measured using standard cytokine assays in which a two fold increase in the level of cytokine release (*e.g.*, TNF or IFN-γ) is indicative of T cell activation (*see* Coligan et al., Current Protocols in Immunology, vol. 1, Wiley Interscience (Greene 1998)). T cells that have been activated in response to a breast tumor polypeptide, polynucleotide or polypeptide-expressing APC may be CD4<sup>+</sup> and/or CD8<sup>+</sup>. Breast tumor protein-specific T cells may be expanded using standard techniques. Within preferred embodiments, the T cells are derived from either a patient or a related, or unrelated, donor and are administered to the patient following stimulation and expansion.

For therapeutic purposes, CD4<sup>+</sup> or CD8<sup>+</sup> T cells that proliferate in response to a breast tumor polypeptide, polynucleotide or APC can be expanded in number either *in vitro* or *in vivo*. Proliferation of such T cells *in vitro* may be accomplished in a variety of ways. For example, the T cells can be re-exposed to a breast tumor polypeptide, or a short peptide corresponding to an immunogenic portion of such a polypeptide, with or without the addition of T cell growth factors, such as interleukin-2, and/or stimulator cells that synthesize a breast tumor polypeptide. Alternatively, one or more T cells that proliferate in the presence of a breast tumor protein can be expanded in number by cloning. Methods for cloning cells are well known in the art, and include limiting dilution.

#### PHARMACEUTICAL COMPOSITIONS AND VACCINES

Within certain aspects, polypeptides, polynucleotides, T cells and/or binding agents disclosed herein may be incorporated into pharmaceutical compositions or immunogenic compositions (*i.e.*, vaccines). Pharmaceutical compositions comprise one or more such compounds and a physiologically acceptable carrier. Vaccines may comprise one or more such compounds and an immunostimulant. An immunostimulant

may be any substance that enhances an immune response to an exogenous antigen. Examples of immunostimulants include adjuvants, biodegradable microspheres (e.g., polylactic galactide) and liposomes (into which the compound is incorporated; *see e.g.*, Fullerton, U.S. Patent No. 4,235,877). Vaccine preparation is generally described in, for example, M.F. Powell and M.J. Newman, eds., "Vaccine Design (the subunit and adjuvant approach)," Plenum Press (NY, 1995). Pharmaceutical compositions and vaccines within the scope of the present invention may also contain other compounds, which may be biologically active or inactive. For example, one or more immunogenic portions of other tumor antigens may be present, either incorporated into a fusion polypeptide or as a separate compound, within the composition or vaccine.

A pharmaceutical composition or vaccine may contain DNA encoding one or more of the polypeptides as described above, such that the polypeptide is generated *in situ*. As noted above, the DNA may be present within any of a variety of delivery systems known to those of ordinary skill in the art, including nucleic acid expression systems, bacteria and viral expression systems. Numerous gene delivery techniques are well known in the art, such as those described by Rolland, *Crit. Rev. Therap. Drug Carrier Systems* 15:143-198, 1998, and references cited therein. Appropriate nucleic acid expression systems contain the necessary DNA sequences for expression in the patient (such as a suitable promoter and terminating signal). Bacterial delivery systems involve the administration of a bacterium (such as *Bacillus-Calmette-Guerrin*) that expresses an immunogenic portion of the polypeptide on its cell surface or secretes such an epitope. In a preferred embodiment, the DNA may be introduced using a viral expression system (e.g., vaccinia or other pox virus, retrovirus, or adenovirus), which may involve the use of a non-pathogenic (defective), replication competent virus. Suitable systems are disclosed, for example, in Fisher-Hoch et al., *Proc. Natl. Acad. Sci. USA* 86:317-321, 1989; Flexner et al., *Ann. N.Y. Acad. Sci.* 569:86-103, 1989; Flexner et al., *Vaccine* 8:17-21, 1990; U.S. Patent Nos. 4,603,112, 4,769,330, and 5,017,487; WO 89/01973; U.S. Patent No. 4,777,127; GB 2,200,651; EP 0,345,242; WO 91/02805; Berkner, *Biotechniques* 6:616-627, 1988; Rosenfeld et al., *Science* 252:431-434, 1991; Kolls et al., *Proc. Natl. Acad. Sci. USA* 91:215-219, 1994; Kass-Eisler et al., *Proc. Natl. Acad. Sci. USA* 90:11498-11502, 1993; Guzman et al., *Circulation* 88:2838-2848, 1993;

and Guzman et al., *Cir. Res.* 73:1202-1207, 1993. Techniques for incorporating DNA into such expression systems are well known to those of ordinary skill in the art. The DNA may also be "naked," as described, for example, in Ulmer et al., *Science* 259:1745-1749, 1993 and reviewed by Cohen, *Science* 259:1691-1692, 1993. The uptake of naked DNA may be increased by coating the DNA onto biodegradable beads, which are efficiently transported into the cells.

While any suitable carrier known to those of ordinary skill in the art may be employed in the pharmaceutical compositions of this invention, the type of carrier will vary depending on the mode of administration. Compositions of the present invention may be formulated for any appropriate manner of administration, including for example, topical, oral, nasal, intravenous, intracranial, intraperitoneal, subcutaneous or intramuscular administration. For parenteral administration, such as subcutaneous injection, the carrier preferably comprises water, saline, alcohol, a fat, a wax or a buffer. For oral administration, any of the above carriers or a solid carrier, such as mannitol, lactose, starch, magnesium stearate, sodium saccharine, talcum, cellulose, glucose, sucrose, and magnesium carbonate, may be employed. Biodegradable microspheres (e.g., polylactate polyglycolate) may also be employed as carriers for the pharmaceutical compositions of this invention. Suitable biodegradable microspheres are disclosed, for example, in U.S. Patent Nos. 4,897,268 and 5,075,109.

Such compositions may also comprise buffers (e.g., neutral buffered saline or phosphate buffered saline), carbohydrates (e.g., glucose, mannose, sucrose or dextrans), mannitol, proteins, polypeptides or amino acids such as glycine, antioxidants, chelating agents such as EDTA or glutathione, adjuvants (e.g., aluminum hydroxide) and/or preservatives. Alternatively, compositions of the present invention may be formulated as a lyophilizate. Compounds may also be encapsulated within liposomes using well known technology.

Any of a variety of immunostimulants may be employed in the vaccines of this invention. For example, an adjuvant may be included. Most adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, *Bordetella pertussis* or *Mycobacterium tuberculosis* derived proteins. Suitable adjuvants

are commercially available as, for example, Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides; polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF or interleukin-2, -7, or -12, may also be used as adjuvants.

Within the vaccines provided herein, the adjuvant composition is preferably designed to induce an immune response predominantly of the Th1 type. High levels of Th1-type cytokines (*e.g.*, IFN- $\gamma$ , TNF- $\alpha$ , IL-2 and IL-12) tend to favor the induction of cell mediated immune responses to an administered antigen. In contrast, high levels of Th2-type cytokines (*e.g.*, IL-4, IL-5, IL-6 and IL-10) tend to favor the induction of humoral immune responses. Following application of a vaccine as provided herein, a patient will support an immune response that includes Th1- and Th2-type responses. Within a preferred embodiment, in which a response is predominantly Th1-type, the level of Th1-type cytokines will increase to a greater extent than the level of Th2-type cytokines. The levels of these cytokines may be readily assessed using standard assays. For a review of the families of cytokines, see Mosmann and Coffman, *Ann. Rev. Immunol.* 7:145-173, 1989.

Preferred adjuvants for use in eliciting a predominantly Th1-type response include, for example, a combination of monophosphoryl lipid A, preferably 3-de-O-acylated monophosphoryl lipid A (3D-MPL), together with an aluminum salt. MPL adjuvants are available from Ribi ImmunoChem Research Inc. (Hamilton, MT) (*see* US Patent Nos. 4,436,727; 4,877,611; 4,866,034 and 4,912,094). CpG-containing oligonucleotides (in which the CpG dinucleotide is unmethylated) also induce a predominantly Th1 response. Such oligonucleotides are well known and are described, for example, in WO 96/02555. Another preferred adjuvant is a saponin, preferably QS21, which may be used alone or in combination with other adjuvants. For example, an enhanced system involves the combination of a monophosphoryl lipid A and saponin derivative, such as the combination of QS21 and 3D-MPL as described in WO 94/00153,

or a less reactogenic composition where the QS21 is quenched with cholesterol, as described in WO 96/33739. Other preferred formulations comprises an oil-in-water emulsion and tocopherol. A particularly potent adjuvant formulation involving QS21, 3D-MPL and tocopherol in an oil-in-water emulsion is described in WO 95/17210. Any vaccine provided herein may be prepared using well known methods that result in a combination of antigen, immune response enhancer and a suitable carrier or excipient.

The compositions described herein may be administered as part of a sustained release formulation (*i.e.*, a formulation such as a capsule, sponge or gel (composed of polysaccharides, for example) that effects a slow release of compound following administration). Such formulations may generally be prepared using well known technology and administered by, for example, oral, rectal or subcutaneous implantation, or by implantation at the desired target site. Sustained-release formulations may contain a polypeptide, polynucleotide or antibody dispersed in a carrier matrix and/or contained within a reservoir surrounded by a rate controlling membrane. Carriers for use within such formulations are biocompatible, and may also be biodegradable; preferably the formulation provides a relatively constant level of active component release. The amount of active compound contained within a sustained release formulation depends upon the site of implantation, the rate and expected duration of release and the nature of the condition to be treated or prevented.

Any of a variety of delivery vehicles may be employed within pharmaceutical compositions and vaccines to facilitate production of an antigen-specific immune response that targets tumor cells. Delivery vehicles include antigen presenting cells (APCs), such as dendritic cells, macrophages, B cells, monocytes and other cells that may be engineered to be efficient APCs. Such cells may, but need not, be genetically modified to increase the capacity for presenting the antigen, to improve activation and/or maintenance of the T cell response, to have anti-tumor effects *per se* and/or to be immunologically compatible with the receiver (*i.e.*, matched HLA haplotype). APCs may generally be isolated from any of a variety of biological fluids and organs, including tumor and peritumoral tissues, and may be autologous, allogeneic, syngeneic or xenogeneic cells.

Certain preferred embodiments of the present invention use dendritic cells

or progenitors thereof as antigen-presenting cells. Dendritic cells are highly potent APCs (Banchereau and Steinman, *Nature* 392:245-251, 1998) and have been shown to be effective as a physiological adjuvant for eliciting prophylactic or therapeutic antitumor immunity (see Timmerman and Levy, *Ann. Rev. Med.* 50:507-529, 1999). In general, dendritic cells may be identified based on their typical shape (stellate *in situ*, with marked cytoplasmic processes (dendrites) visible *in vitro*), their ability to take up, process and present antigens with high efficiency, and their ability to activate naïve T cell responses. Dendritic cells may, of course, be engineered to express specific cell-surface receptors or ligands that are not commonly found on dendritic cells *in vivo* or *ex vivo*, and such modified dendritic cells are contemplated by the present invention. As an alternative to dendritic cells, secreted vesicles antigen-loaded dendritic cells (called exosomes) may be used within a vaccine (see Zitvogel et al., *Nature Med.* 4:594-600, 1998).

Dendritic cells and progenitors may be obtained from peripheral blood, bone marrow, tumor-infiltrating cells, peritumoral tissues-infiltrating cells, lymph nodes, spleen, skin, umbilical cord blood or any other suitable tissue or fluid. For example, dendritic cells may be differentiated *ex vivo* by adding a combination of cytokines such as GM-CSF, IL-4, IL-13 and/or TNF $\alpha$  to cultures of monocytes harvested from peripheral blood. Alternatively, CD34 positive cells harvested from peripheral blood, umbilical cord blood or bone marrow may be differentiated into dendritic cells by adding to the culture medium combinations of GM-CSF, IL-3, TNF $\alpha$ , CD40 ligand, LPS, flt3 ligand and/or other compound(s) that induce differentiation, maturation and proliferation of dendritic cells.

Dendritic cells are conveniently categorized as "immature" and "mature" cells, which allows a simple way to discriminate between two well characterized phenotypes. However, this nomenclature should not be construed to exclude all possible intermediate stages of differentiation. Immature dendritic cells are characterized as APC with a high capacity for antigen uptake and processing, which correlates with the high expression of Fc $\gamma$  receptor and mannose receptor. The mature phenotype is typically characterized by a lower expression of these markers, but a high expression of cell



surface molecules responsible for T cell activation such as class I and class II MHC, adhesion molecules (e.g., CD54 and CD11) and costimulatory molecules (e.g., CD40, CD80, CD86 and 4-1BB).

APCs may generally be transfected with a polynucleotide encoding a breast tumor protein (or portion or other variant thereof) such that the breast tumor polypeptide, or an immunogenic portion thereof, is expressed on the cell surface. Such transfection may take place *ex vivo*, and a composition or vaccine comprising such transfected cells may then be used for therapeutic purposes, as described herein. Alternatively, a gene delivery vehicle that targets a dendritic or other antigen presenting cell may be administered to a patient, resulting in transfection that occurs *in vivo*. *In vivo* and *ex vivo* transfection of dendritic cells, for example, may generally be performed using any methods known in the art, such as those described in WO 97/24447, or the gene gun approach described by Mahvi et al., *Immunology and cell Biology* 75:456-460, 1997. Antigen loading of dendritic cells may be achieved by incubating dendritic cells or progenitor cells with the breast tumor polypeptide, DNA (naked or within a plasmid vector) or RNA; or with antigen-expressing recombinant bacterium or viruses (e.g., vaccinia, fowlpox, adenovirus or lentivirus vectors). Prior to loading, the polypeptide may be covalently conjugated to an immunological partner that provides T cell help (e.g., a carrier molecule). Alternatively, a dendritic cell may be pulsed with a non-conjugated immunological partner, separately or in the presence of the polypeptide.

#### CANCER THERAPY

In further aspects of the present invention, the compositions described herein may be used for immunotherapy of cancer, such as breast cancer. Within such methods, pharmaceutical compositions and vaccines are typically administered to a patient. As used herein, a "patient" refers to any warm-blooded animal, preferably a human. A patient may or may not be afflicted with cancer. Accordingly, the above pharmaceutical compositions and vaccines may be used to prevent the development of a cancer or to treat a patient afflicted with a cancer. A cancer may be diagnosed using criteria generally accepted in the art, including the presence of a malignant tumor. Pharmaceutical compositions and vaccines may be administered either prior to or

following surgical removal of primary tumors and/or treatment such as administration of radiotherapy or conventional chemotherapeutic drugs.

Within certain embodiments, immunotherapy may be active immunotherapy, in which treatment relies on the *in vivo* stimulation of the endogenous host immune system to react against tumors with the administration of immune response-modifying agents (such as polypeptides and polynucleotides disclosed herein).

Within other embodiments, immunotherapy may be passive immunotherapy, in which treatment involves the delivery of agents with established tumor-immune reactivity (such as effector cells or antibodies) that can directly or indirectly mediate antitumor effects and does not necessarily depend on an intact host immune system. Examples of effector cells include T cells as discussed above, T lymphocytes (such as CD8<sup>+</sup> cytotoxic T lymphocytes and CD4<sup>+</sup> T-helper tumor-infiltrating lymphocytes), killer cells (such as Natural Killer cells and lymphokine-activated killer cells), B cells and antigen-presenting cells (such as dendritic cells and macrophages) expressing a polypeptide provided herein. T cell receptors and antibody receptors specific for the polypeptides recited herein may be cloned, expressed and transferred into other vectors or effector cells for adoptive immunotherapy. The polypeptides provided herein may also be used to generate antibodies or anti-idiotypic antibodies (as described above and in U.S. Patent No. 4,918,164) for passive immunotherapy.

Effector cells may generally be obtained in sufficient quantities for adoptive immunotherapy by growth *in vitro*, as described herein. Culture conditions for expanding single antigen-specific effector cells to several billion in number with retention of antigen recognition *in vivo* are well known in the art. Such *in vitro* culture conditions typically use intermittent stimulation with antigen, often in the presence of cytokines (such as IL-2) and non-dividing feeder cells. As noted above, immunoreactive polypeptides as provided herein may be used to rapidly expand antigen-specific T cell cultures in order to generate a sufficient number of cells for immunotherapy. In particular, antigen-presenting cells, such as dendritic, macrophage, monocyte, fibroblast or B cells, may be pulsed with immunoreactive polypeptides or transfected with one or more polynucleotides using standard techniques well known in the art. For example,

antigen-presenting cells can be transfected with a polynucleotide having a promoter appropriate for increasing expression in a recombinant virus or other expression system. Cultured effector cells for use in therapy must be able to grow and distribute widely, and to survive long term *in vivo*. Studies have shown that cultured effector cells can be induced to grow *in vivo* and to survive long term in substantial numbers by repeated stimulation with antigen supplemented with IL-2 (*see, for example, Cheever et al., Immunological Reviews 157:177, 1997*).

Alternatively, a vector expressing a polypeptide recited herein may be introduced into antigen presenting cells taken from a patient and clonally propagated *ex vivo* for transplant back into the same patient. Transfected cells may be reintroduced into the patient using any means known in the art, preferably in sterile form by intravenous, intracavitary, intraperitoneal or intratumor administration.

Routes and frequency of administration of the therapeutic compositions disclosed herein, as well as dosage, will vary from individual to individual, and may be readily established using standard techniques. In general, the pharmaceutical compositions and vaccines may be administered by injection (*e.g.*, intracutaneous, intramuscular, intravenous or subcutaneous), intranasally (*e.g.*, by aspiration) or orally. Preferably, between 1 and 10 doses may be administered over a 52 week period. Preferably, 6 doses are administered, at intervals of 1 month, and booster vaccinations may be given periodically thereafter. Alternate protocols may be appropriate for individual patients. A suitable dose is an amount of a compound that, when administered as described above, is capable of promoting an anti-tumor immune response, and is at least 10-50% above the basal (*i.e.*, untreated) level. Such response can be monitored by measuring the anti-tumor antibodies in a patient or by vaccine-dependent generation of cytolytic effector cells capable of killing the patient's tumor cells *in vitro*. Such vaccines should also be capable of causing an immune response that leads to an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial or longer disease-free survival) in vaccinated patients as compared to non-vaccinated patients. In general, for pharmaceutical compositions and vaccines comprising one or more polypeptides, the amount of each polypeptide present in a dose ranges from about 100  $\mu$ g to 5 mg per kg of

host. Suitable dose sizes will vary with the size of the patient, but will typically range from about 0.1 mL to about 5 mL.

In general, an appropriate dosage and treatment regimen provides the active compound(s) in an amount sufficient to provide therapeutic and/or prophylactic benefit. Such a response can be monitored by establishing an improved clinical outcome (e.g., more frequent remissions, complete or partial, or longer disease-free survival) in treated patients as compared to non-treated patients. Increases in preexisting immune responses to a breast tumor protein generally correlate with an improved clinical outcome. Such immune responses may generally be evaluated using standard proliferation, cytotoxicity or cytokine assays, which may be performed using samples obtained from a patient before and after treatment.

#### METHODS FOR DETECTING CANCER

In general, a cancer may be detected in a patient based on the presence of one or more breast tumor proteins and/or polynucleotides encoding such proteins in a biological sample (for example, blood, sera, urine and/or tumor biopsies) obtained from the patient. In other words, such proteins may be used as markers to indicate the presence or absence of a cancer such as breast cancer. In addition, such proteins may be useful for the detection of other cancers. The binding agents provided herein generally permit detection of the level of antigen that binds to the agent in the biological sample. Polynucleotide primers and probes may be used to detect the level of mRNA encoding a tumor protein, which is also indicative of the presence or absence of a cancer. In general, a breast tumor sequence should be present at a level that is at least three fold higher in tumor tissue than in normal tissue.

There are a variety of assay formats known to those of ordinary skill in the art for using a binding agent to detect polypeptide markers in a sample. See, e.g., Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, the presence or absence of a cancer in a patient may be determined by (a) contacting a biological sample obtained from a patient with a binding agent; (b) detecting in the sample a level of polypeptide that binds to the binding agent; and (c) comparing the level of polypeptide with a predetermined cut-off value.

In a preferred embodiment, the assay involves the use of binding agent immobilized on a solid support to bind to and remove the polypeptide from the remainder of the sample. The bound polypeptide may then be detected using a detection reagent that contains a reporter group and specifically binds to the binding agent/polypeptide complex. Such detection reagents may comprise, for example, a binding agent that specifically binds to the polypeptide or an antibody or other agent that specifically binds to the binding agent, such as an anti-immunoglobulin, protein G, protein A or a lectin. Alternatively, a competitive assay may be utilized, in which a polypeptide is labeled with a reporter group and allowed to bind to the immobilized binding agent after incubation of the binding agent with the sample. The extent to which components of the sample inhibit the binding of the labeled polypeptide to the binding agent is indicative of the reactivity of the sample with the immobilized binding agent. Suitable polypeptides for use within such assays include full length breast tumor proteins and portions thereof to which the binding agent binds, as described above.

The solid support may be any material known to those of ordinary skill in the art to which the tumor protein may be attached. For example, the solid support may be a test well in a microtiter plate or a nitrocellulose or other suitable membrane. Alternatively, the support may be a bead or disc, such as glass, fiberglass, latex or a plastic material such as polystyrene or polyvinylchloride. The support may also be a magnetic particle or a fiber optic sensor, such as those disclosed, for example, in U.S. Patent No. 5,359,681. The binding agent may be immobilized on the solid support using a variety of techniques known to those of skill in the art, which are amply described in the patent and scientific literature. In the context of the present invention, the term "immobilization" refers to both noncovalent association, such as adsorption, and covalent attachment (which may be a direct linkage between the agent and functional groups on the support or may be a linkage by way of a cross-linking agent). Immobilization by adsorption to a well in a microtiter plate or to a membrane is preferred. In such cases, adsorption may be achieved by contacting the binding agent, in a suitable buffer, with the solid support for a suitable amount of time. The contact time varies with temperature, but is typically between about 1 hour and about 1 day. In general, contacting a well of a plastic microtiter plate (such as polystyrene or polyvinylchloride) with an amount of

binding agent ranging from about 10 ng to about 10  $\mu$ g, and preferably about 100 ng to about 1  $\mu$ g, is sufficient to immobilize an adequate amount of binding agent.

Covalent attachment of binding agent to a solid support may generally be achieved by first reacting the support with a bifunctional reagent that will react with both the support and a functional group, such as a hydroxyl or amino group, on the binding agent. For example, the binding agent may be covalently attached to supports having an appropriate polymer coating using benzoquinone or by condensation of an aldehyde group on the support with an amine and an active hydrogen on the binding partner (*see, e.g.,* Pierce Immunotechnology Catalog and Handbook, 1991, at A12-A13).

In certain embodiments, the assay is a two-antibody sandwich assay. This assay may be performed by first contacting an antibody that has been immobilized on a solid support, commonly the well of a microtiter plate, with the sample, such that polypeptides within the sample are allowed to bind to the immobilized antibody. Unbound sample is then removed from the immobilized polypeptide-antibody complexes and a detection reagent (preferably a second antibody capable of binding to a different site on the polypeptide) containing a reporter group is added. The amount of detection reagent that remains bound to the solid support is then determined using a method appropriate for the specific reporter group.

More specifically, once the antibody is immobilized on the support as described above, the remaining protein binding sites on the support are typically blocked. Any suitable blocking agent known to those of ordinary skill in the art, such as bovine serum albumin or Tween 20™ (Sigma Chemical Co., St. Louis, MO). The immobilized antibody is then incubated with the sample, and polypeptide is allowed to bind to the antibody. The sample may be diluted with a suitable diluent, such as phosphate-buffered saline (PBS) prior to incubation. In general, an appropriate contact time (*i.e.,* incubation time) is a period of time that is sufficient to detect the presence of polypeptide within a sample obtained from an individual with breast cancer. Preferably, the contact time is sufficient to achieve a level of binding that is at least about 95% of that achieved at equilibrium between bound and unbound polypeptide. Those of ordinary skill in the art will recognize that the time necessary to achieve equilibrium may be readily determined

by assaying the level of binding that occurs over a period of time. At room temperature, an incubation time of about 30 minutes is generally sufficient.

Unbound sample may then be removed by washing the solid support with an appropriate buffer, such as PBS containing 0.1% Tween 20™. The second antibody, which contains a reporter group, may then be added to the solid support. Preferred reporter groups include those groups recited above.

The detection reagent is then incubated with the immobilized antibody-polypeptide complex for an amount of time sufficient to detect the bound polypeptide. An appropriate amount of time may generally be determined by assaying the level of binding that occurs over a period of time. Unbound detection reagent is then removed and bound detection reagent is detected using the reporter group. The method employed for detecting the reporter group depends upon the nature of the reporter group. For radioactive groups, scintillation counting or autoradiographic methods are generally appropriate. Spectroscopic methods may be used to detect dyes, luminescent groups and fluorescent groups. Biotin may be detected using avidin, coupled to a different reporter group (commonly a radioactive or fluorescent group or an enzyme). Enzyme reporter groups may generally be detected by the addition of substrate (generally for a specific period of time), followed by spectroscopic or other analysis of the reaction products.

To determine the presence or absence of a cancer, such as breast cancer, the signal detected from the reporter group that remains bound to the solid support is generally compared to a signal that corresponds to a predetermined cut-off value. In one preferred embodiment, the cut-off value for the detection of a cancer is the average mean signal obtained when the immobilized antibody is incubated with samples from patients without the cancer. In general, a sample generating a signal that is three standard deviations above the predetermined cut-off value is considered positive for the cancer. In an alternate preferred embodiment, the cut-off value is determined using a Receiver Operator Curve, according to the method of Sackett et al., *Clinical Epidemiology: A Basic Science for Clinical Medicine*, Little Brown and Co., 1985, p. 106-7. Briefly, in this embodiment, the cut-off value may be determined from a plot of pairs of true positive rates (*i.e.*, sensitivity) and false positive rates (100%-specificity) that correspond

to each possible cut-off value for the diagnostic test result. The cut-off value on the plot that is the closest to the upper left-hand corner (*i.e.*, the value that encloses the largest area) is the most accurate cut-off value, and a sample generating a signal that is higher than the cut-off value determined by this method may be considered positive. Alternatively, the cut-off value may be shifted to the left along the plot, to minimize the false positive rate, or to the right, to minimize the false negative rate. In general, a sample generating a signal that is higher than the cut-off value determined by this method is considered positive for a cancer.

In a related embodiment, the assay is performed in a flow-through or strip test format, wherein the binding agent is immobilized on a membrane, such as nitrocellulose. In the flow-through test, polypeptides within the sample bind to the immobilized binding agent as the sample passes through the membrane. A second, labeled binding agent then binds to the binding agent-polypeptide complex as a solution containing the second binding agent flows through the membrane. The detection of bound second binding agent may then be performed as described above. In the strip test format, one end of the membrane to which binding agent is bound is immersed in a solution containing the sample. The sample migrates along the membrane through a region containing second binding agent and to the area of immobilized binding agent. Concentration of second binding agent at the area of immobilized antibody indicates the presence of a cancer. Typically, the concentration of second binding agent at that site generates a pattern, such as a line, that can be read visually. The absence of such a pattern indicates a negative result. In general, the amount of binding agent immobilized on the membrane is selected to generate a visually discernible pattern when the biological sample contains a level of polypeptide that would be sufficient to generate a positive signal in the two-antibody sandwich assay, in the format discussed above. Preferred binding agents for use in such assays are antibodies and antigen-binding fragments thereof. Preferably, the amount of antibody immobilized on the membrane ranges from about 25 ng to about 1 $\mu$ g, and more preferably from about 50 ng to about 500 ng. Such tests can typically be performed with a very small amount of biological sample.



Of course, numerous other assay protocols exist that are suitable for use with the tumor proteins or binding agents of the present invention. The above descriptions are intended to be exemplary only. For example, it will be apparent to those of ordinary skill in the art that the above protocols may be readily modified to use breast tumor polypeptides to detect antibodies that bind to such polypeptides in a biological sample. The detection of such breast tumor protein specific antibodies may correlate with the presence of a cancer.

A cancer may also, or alternatively, be detected based on the presence of T cells that specifically react with a breast tumor protein in a biological sample. Within certain methods, a biological sample comprising CD4<sup>+</sup> and/or CD8<sup>+</sup> T cells isolated from a patient is incubated with a breast tumor polypeptide, a polynucleotide encoding such a polypeptide and/or an APC that expresses at least an immunogenic portion of such a polypeptide, and the presence or absence of specific activation of the T cells is detected. Suitable biological samples include, but are not limited to, isolated T cells. For example, T cells may be isolated from a patient by routine techniques (such as by Ficoll/Hypaque density gradient centrifugation of peripheral blood lymphocytes). T cells may be incubated *in vitro* for 2-9 days (typically 4 days) at 37°C with polypeptide (*e.g.*, 5 - 25 µg/ml). It may be desirable to incubate another aliquot of a T cell sample in the absence of breast tumor polypeptide to serve as a control. For CD4<sup>+</sup> T cells, activation is preferably detected by evaluating proliferation of the T cells. For CD8<sup>+</sup> T cells, activation is preferably detected by evaluating cytolytic activity. A level of proliferation that is at least two fold greater and/or a level of cytolytic activity that is at least 20% greater than in disease-free patients indicates the presence of a cancer in the patient.

As noted above, a cancer may also, or alternatively, be detected based on the level of mRNA encoding a breast tumor protein in a biological sample. For example, at least two oligonucleotide primers may be employed in a polymerase chain reaction (PCR) based assay to amplify a portion of a breast tumor cDNA derived from a biological sample, wherein at least one of the oligonucleotide primers is specific for (*i.e.*, hybridizes to) a polynucleotide encoding the breast tumor protein. The amplified cDNA is then separated and detected using techniques well known in the art, such as gel electrophoresis. Similarly, oligonucleotide probes that specifically hybridize to a polynucleotide encoding a breast tumor protein may be used in a hybridization assay to detect the presence of polynucleotide encoding the tumor protein in a biological sample.

To permit hybridization under assay conditions, oligonucleotide primers and probes should comprise an oligonucleotide sequence that has at least about 60%, preferably at least about 75% and more preferably at least about 90%, identity to a portion of a polynucleotide encoding a breast tumor protein that is at least 10 nucleotides,

and preferably at least 20 nucleotides, in length. Preferably, oligonucleotide primers and/or probes will hybridize to a polynucleotide encoding a polypeptide disclosed herein under moderately stringent conditions, as defined above. Oligonucleotide primers and/or probes which may be usefully employed in the diagnostic methods described herein preferably are at least 10-40 nucleotides in length. In a preferred embodiment, the oligonucleotide primers comprise at least 10 contiguous nucleotides, more preferably at least 15 contiguous nucleotides, of a DNA molecule having a sequence recited in SEQ ID NOS:1-175, 178, 180 and 182-468. Techniques for both PCR based assays and hybridization assays are well known in the art (*see, for example, Mullis et al., Cold Spring Harbor Symp. Quant. Biol., 51:263, 1987; Erlich ed., PCR Technology, Stockton Press, NY, 1989*).

One preferred assay employs RT-PCR, in which PCR is applied in conjunction with reverse transcription. Typically, RNA is extracted from a biological sample, such as biopsy tissue, and is reverse transcribed to produce cDNA molecules. PCR amplification using at least one specific primer generates a cDNA molecule, which may be separated and visualized using, for example, gel electrophoresis. Amplification may be performed on biological samples taken from a test patient and from an individual who is not afflicted with a cancer. The amplification reaction may be performed on several dilutions of cDNA spanning two orders of magnitude. A two-fold or greater increase in expression in several dilutions of the test patient sample as compared to the same dilutions of the non-cancerous sample is typically considered positive.

In another embodiment, the disclosed compositions may be used as markers for the progression of cancer. In this embodiment, assays as described above for the diagnosis of a cancer may be performed over time, and the change in the level of reactive polypeptide(s) or polynucleotide evaluated. For example, the assays may be performed every 24-72 hours for a period of 6 months to 1 year, and thereafter performed as needed. In general, a cancer is progressing in those patients in whom the level of polypeptide or polynucleotide detected increases over time. In contrast, the cancer is not progressing when the level of reactive polypeptide or polynucleotide either remains constant or decreases with time.

Certain *in vivo* diagnostic assays may be performed directly on a tumor.

One such assay involves contacting tumor cells with a binding agent. The bound binding agent may then be detected directly or indirectly via a reporter group. Such binding agents may also be used in histological applications. Alternatively, polynucleotide probes may be used within such applications.

As noted above, to improve sensitivity, multiple breast tumor protein markers may be assayed within a given sample. It will be apparent that binding agents specific for different proteins provided herein may be combined within a single assay. Further, multiple primers or probes may be used concurrently. The selection of tumor protein markers may be based on routine experiments to determine combinations that results in optimal sensitivity. In addition, or alternatively, assays for tumor proteins provided herein may be combined with assays for other known tumor antigens.

#### DIAGNOSTIC KITS

The present invention further provides kits for use within any of the above diagnostic methods. Such kits typically comprise two or more components necessary for performing a diagnostic assay. Components may be compounds, reagents, containers and/or equipment. For example, one container within a kit may contain a monoclonal antibody or fragment thereof that specifically binds to a breast tumor protein. Such antibodies or fragments may be provided attached to a support material, as described above. One or more additional containers may enclose elements, such as reagents or buffers, to be used in the assay. Such kits may also, or alternatively, contain a detection reagent as described above that contains a reporter group suitable for direct or indirect detection of antibody binding.

Alternatively, a kit may be designed to detect the level of mRNA encoding a breast tumor protein in a biological sample. Such kits generally comprise at least one oligonucleotide probe or primer, as described above, that hybridizes to a polynucleotide encoding a breast tumor protein. Such an oligonucleotide may be used, for example, within a PCR or hybridization assay. Additional components that may be present within such kits include a second oligonucleotide and/or a diagnostic reagent or container to facilitate the detection of a polynucleotide encoding a breast tumor protein.

The following Examples are offered by way of illustration and not by way of limitation.

### EXAMPLES

#### Example 1

#### ISOLATION AND CHARACTERIZATION OF BREAST TUMOR POLYPEPTIDES

This Example describes the isolation of breast tumor polypeptides from a breast tumor cDNA library.

A cDNA subtraction library containing cDNA from breast tumor subtracted with normal breast cDNA was constructed as follows. Total RNA was extracted from primary tissues using Trizol reagent (Gibco BRL Life Technologies, Gaithersburg, MD) as described by the manufacturer. The polyA<sup>+</sup> RNA was purified using an oligo(dT) cellulose column according to standard protocols. First strand cDNA was synthesized using the primer supplied in a Clontech PCR-Select cDNA Subtraction Kit (Clontech, Palo Alto, CA). The driver DNA consisted of cDNAs from two normal breast tissues with the tester cDNA being from three primary breast tumors. Double-stranded cDNA was synthesized for both tester and driver, and digested with a combination of endonucleases (MluI, MscI, PvuII, Sall and StuI) which recognize six base pairs DNA. This modification increased the average cDNA size dramatically compared with cDNAs generated according to the protocol of Clontech (Palo Alto, CA). The digested tester cDNAs were ligated to two different adaptors and the subtraction was performed according to Clontech's protocol. The subtracted cDNAs were subjected to two rounds of PCR amplification, following the manufacturer's protocol. The resulting PCR products were subcloned into the TA cloning vector, pCRII (Invitrogen, San Diego, CA) and transformed into ElectroMax *E. coli* DH10B cells (Gibco BRL Life, Technologies) by electroporation. DNA was isolated from independent clones and sequenced using a Perkin Elmer/Applied Biosystems Division (Foster City, CA) Automated Sequencer Model 373A.

Sixty-three distinct cDNA clones were found in the subtracted breast tumor-specific cDNA library. The determined one strand (5' or 3') cDNA sequences for the clones are provided in SEQ ID NO: 1-61, 72 and 73, respectively. Comparison of these cDNA sequences with known sequences in the gene bank using the EMBL and GenBank databases (Release 97) revealed no significant homologies to the sequences provided in SEQ ID NO: 14, 21, 22, 27, 29, 30, 32, 38, 44, 45, 53, 72 and 73. The sequences of SEQ ID NO: 1, 3, 16, 17, 34, 48, 57, 60 and 61 were found to represent known human genes. The sequences of SEQ ID NO: 2, 4, 23, 39 and 50 were found to show some similarity to previously identified non-human genes. The remaining clones (SEQ ID NO: 5-13, 15, 18-20, 24-26, 28, 31, 33, 35-37, 40-43, 46, 47, 49, 51, 52, 54-56, 58 and 59) were found to show at least some degree of homology to previously identified expressed sequence tags (ESTs).

To determine mRNA expression levels of the isolated cDNA clones, cDNA clones from the breast subtraction described above were randomly picked and colony PCR amplified. Their mRNA expression levels in breast tumor, normal breast and various other normal tissues were determined using microarray technology (Synteni, Palo Alto, CA). Briefly, the PCR amplification products were arrayed onto slides in an array format, with each product occupying a unique location in the array. mRNA was extracted from the tissue sample to be tested, reverse transcribed, and fluorescent-labeled cDNA probes were generated. The microarrays were probed with the labeled cDNA probes, the slides scanned and fluorescence intensity was measured. Data was analyzed using Synteni provided GEMTOOLS Software. Of the seventeen cDNA clones examined, those of SEQ ID NO: 40, 46, 59 and 73 were found to be over-expressed in breast tumor and expressed at low levels in all normal tissues tested (breast, PBMC, colon, fetal tissue, salivary gland, bone marrow, lung, pancreas, large intestine, spinal cord, adrenal gland, kidney, pancreas, liver, stomach, skeletal muscle, heart, small intestine, skin, brain and human mammary epithelial cells). The clones of SEQ ID NO: 41 and 48 were found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested, with the exception of bone marrow. The clone of SEQ ID NO: 42 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested except bone marrow and spinal cord. The clone of SEQ ID NO: 43 was

found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of spinal cord, heart and small intestine. The clone of SEQ ID NO: 51 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of large intestine. The clone of SEQ ID NO: 54 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of PBMC, stomach and small intestine. The clone of SEQ ID NO: 56 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of large and small intestine, human mammary epithelia cells and SCID mouse-passaged breast tumor. The clone of SEQ ID NO: 60 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of spinal cord and heart. The clone of SEQ ID NO: 61 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of small intestine. The clone of SEQ ID NO: 72 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of colon and salivary gland.

The results of a Northern blot analysis of the clone SYN18C6 (SEQ ID NO: 40) are shown in Fig. 1. A predicted protein sequence encoded by SYN18C6 is provided in SEQ ID NO: 62.

Additional cDNA clones that are over-expressed in breast tumor tissue were isolated from breast cDNA subtraction libraries as follows. Breast subtraction libraries were prepared, as described above, by PCR-based subtraction employing pools of breast tumor cDNA as the tester and pools of either normal breast cDNA or cDNA from other normal tissues as the driver. cDNA clones from breast subtraction were randomly picked and colony PCR amplified and their mRNA expression levels in breast tumor, normal breast and various other normal tissues were determined using the microarray technology described above. Twenty-four distinct cDNA clones were found to be over-expressed in breast tumor and expressed at low levels in all normal tissues tested (breast, brain, liver, pancreas, lung, salivary gland, stomach, colon, kidney, bone marrow, skeletal muscle, PBMC, heart, small intestine, adrenal gland, spinal cord, large intestine and skin). The determined partial cDNA sequences for these clones are provided in SEQ ID NO: 63-87. Comparison of the sequences of SEQ ID NO: 74-87

with those in the gene bank as described above, revealed homology to previously identified human genes. No significant homologies were found to the sequences of SEQ ID NO: 63-73.

Three DNA isoforms for the clone B726P (partial sequence provided in SEQ ID NO: 71) were isolated as follows. A radioactive probe was synthesized from B726P by excising B726P DNA from a pT7Blue vector (Novagen) by a BamHI/XbaI restriction digest and using the resulting DNA as the template in a single-stranded PCR in the presence of [ $\alpha$ -<sup>32</sup>P]dCTP. The sequence of the primer employed for this PCR is provided in SEQ ID NO: 177. The resulting radioactive probe was used to probe a directional cDNA library and a random-primed cDNA library made using RNA isolated from breast tumors. Eighty-five clones were identified, excised, purified and sequenced. Of these 85 clones, three were found to each contain a significant open reading frame. The determined cDNA sequence of the isoform B726P-20 is provided in SEQ ID NO: 175, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 176. The determined cDNA sequence of the isoform B726P-74 is provided in SEQ ID NO: 178, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 179. The determined cDNA sequence of the isoform B726P-79 is provided in SEQ ID NO: 180, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 181.

Efforts to obtain a full-length clone of B726P using standard techniques led to the isolation of five additional clones that represent additional 5' sequence of B726P. These clones appear to be alternative splice forms of the same gene. The determined cDNA sequences of these clones are provided in SEQ ID NO: 464-468, with the predicted amino acid sequences encoded by SEQ ID NO: 464-467 being provided in SEQ ID NO: 470-473, respectively. Using standard computer techniques, a 3,681 bp consensus DNA sequence (SEQ ID NO: 463) was created that contains two large open reading frames. The downstream ORF encodes the predicted amino acid sequence of SEQ ID NO: 181. The predicted amino acid sequence encoded by the upstream ORF is provided in SEQ ID NO: 469.



Further isolation of individual clones that are over-expressed in breast tumor tissue was conducted using cDNA subtraction library techniques described above. In particular, a cDNA subtraction library containing cDNA from breast tumors subtracted with five other normal human tissue cDNAs (brain, liver, PBMC, pancreas and normal breast) was utilized in this screening. From the original subtraction, one hundred seventy seven clones were selected to be further characterized by DNA sequencing and microarray analysis. Microarray analysis demonstrated that the sequences in SEQ ID NO: 182-251 were 2 or more fold over-expressed in human breast tumor tissues over normal human tissues. No significant homologies were found for nineteen of these clones, including, SEQ ID NO: 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245 and 246, with the exception of some previously identified expressed sequence tags (ESTs). The remaining clones share some homology to previously identified genes, specifically SEQ ID NO: 181-184, 187-193, 195-198, 200-204, 206, 207, 209, 210, 212, 213, 217, 218, 220, 221, 223-225, 227-231, 233-235, 237-239, 242-244 and 247-251.

Of the seventy clones showing over-expression in breast tumor tissues, fifteen demonstrated particularly good expression levels in breast tumor over normal human tissues. The following eleven clones did not show any significant homology to any known genes. Clone 19463.1 (SEQ ID NO: 185) was over-expressed in the majority of breast tumors and also in the SCID breast tumors tested (refer to Example 2); additionally, over-expression was found in a majority of normal breast tissues. Clone 19483.1 (SEQ ID NO: 216) was over-expressed in a few breast tumors, with no over-expression in any normal tissues tested. Clone 19470.1 (SEQ ID NO: 219) was found to be slightly over-expressed in some breast tumors. Clone 19468.1 (SEQ ID NO: 222) was found to be slightly over-expressed in the majority of breast tumors tested. Clone 19505.1 (SEQ ID NO: 226) was found to be slightly over-expressed in 50% of breast tumors, as well as in SCID tumor tissues, with some degree of over-expression in found in normal breast. Clone 1509.1 (SEQ ID NO: 232) was found to be over-expressed in very few breast tumors, but with a certain degree of over-expression in metastatic breast tumor tissues, as well as no significant over-expression found in normal tissues. Clone 19513.1 (SEQ ID NO: 236) was shown to be slightly over-expressed in few breast

tumors, with no significant over-expression levels found in normal tissues. Clone 19575.1 (SEQ ID NO: 240) showed low level over-expression in some breast tumors and also in normal breast. Clone 19560.1 (SEQ ID NO: 241) was over-expressed in 50% of breast tumors tested, as well as in some normal breast tissues. Clone 19583.1 (SEQ ID NO: 245) was slightly over-expressed in some breast tumors, with very low levels of over-expression found in normal tissues. Clone 19587.1 (SEQ ID NO: 246) showed low level over-expression in some breast tumors and no significant over-expression in normal tissues.

Clone 19520.1 (SEQ ID NO: 233), showing homology to clone 102D24 on chromosome 11q13.31, was found to be over-expressed in breast tumors and in SCID tumors. Clone 19517.1 (SEQ ID NO: 237), showing homology to human PAC 128M19 clone, was found to be slightly over-expressed in the majority of breast tumors tested. Clone 19392.2 (SEQ ID NO: 247), showing homology to human chromosome 17, was shown to be over-expressed in 50% of breast tumors tested. Clone 19399.2 (SEQ ID NO: 250), showing homology to human Xp22 BAC GSHB-184P14, was shown to be slightly over-expressed in a limited number of breast tumors tested.

In subsequent studies, 64 individual clones were isolated from a subtracted cDNA library containing cDNA from a pool of breast tumors subtracted with cDNA from five normal tissues (brain, liver, PBMC, pancreas and normal breast). The subtracted cDNA library was prepared as described above with the following modification. A combination of five six-base cutters (MluI, MscI, PvuII, SalI and StuI) was used to digest the cDNA instead of RsaI. This resulted in an increase in the average insert size from 300 bp to 600 bp. The 64 isolated clones were colony PCR amplified and their mRNA expression levels in breast tumor tissue, normal breast and various other normal tissues were examined by microarray technology as described above. The determined cDNA sequences of 11 clones which were found to be over-expressed in breast tumor tissue are provided in SEQ ID NO: 405-415. Comparison of these sequences to those in the public database, as outlined above, revealed homologies between the sequences of SEQ ID NO: 408, 411, 413 and 414 and previously isolated ESTs. The sequences of SEQ ID NO: 405-407, 409, 410, 412 and 415 were found to show some homology to previously identified sequences.

In further studies, a subtracted cDNA library was prepared from cDNA from metastatic breast tumors subtracted with a pool of cDNA from five normal tissues (breast, brain, lung, pancreas and PBMC) using the PCR-subtraction protocol of Clontech, described above. The determined cDNA sequences of 90 clones isolated from this library are provided in SEQ ID NO: 315-404. Comparison of these sequences with those in the public database, as described above, revealed no significant homologies to the sequence of SEQ ID NO: 366. The sequences of SEQ ID NO: 320-324, 342, 353, 367, 368, 377, 382, 385, 389, 395, 397 and 400 were found to show some homology to previously isolated ESTs. The remaining sequences were found to show homology to previously identified gene sequences.

In yet further studies, a subtracted cDNA library (referred to as 2BT) was prepared from cDNA from breast tumors subtracted with a pool of cDNA from six normal tissues (liver, brain, stomach, small intestine, kidney and heart) using the PCR-subtraction protocol of Clontech, described above. cDNA clones isolated from this subtraction were subjected to DNA microarray analysis as described above and the resulting data subjected to four modified Gemtools analyses. The first analysis compared 28 breast tumors with 28 non-breast normal tissues. A mean over-expression of at least 2.1 fold was used as a selection cut-off. The second analysis compared 6 metastatic breast tumors with 29 non-breast normal tissues. A mean over-expression of at least 2.5 fold was used as a cut-off. The third and fourth analyses compared 2 early SCID mouse-passaged with 2 late SCID mouse-passaged tumors. A mean over-expression in the early or late passaged tumors of 2.0 fold or greater was used as a cut-off. In addition, a visual analysis was performed on the microarray data for the 2BT clones. The determined cDNA sequences of 13 clones identified in the visual analysis are provided in SEQ ID NO: 427-439. The determined cDNA sequences of 22 clones identified using the modified Gemtools analysis are provided in SEQ ID NO: 440-462, wherein SEQ ID NO: 453 and 454 represent two partial, non-overlapping, sequences of the same clone.

Comparison of the clone sequences of SEQ ID NO: 436 and 437 (referred to as 263G6 and 262B2) with those in the public databases, as described above, revealed no significant homologies to previously identified sequences. The sequences of SEQ ID NO: 427, 429, 431, 435, 438, 441, 443, 444, 445, 446, 450, 453 and 454 (referred to as

266B4, 266G3, 264B4, 263G1, 262B6, 2BT2-34, 2BT1-77, 2BT1-62, 2BT1-60,61, 2BT1-59, 2BT1-52 and 2BT1-40, respectively) showed some homology to previously isolated expressed sequences tags (ESTs). The sequences of SEQ ID NO: 428, 430, 432, 433, 434, 439, 440, 442, 447, 448, 449, 451, 452 and 455-462 (referred to as clones 22892, 22890, 22883, 22882, 22880, 22869, 21374, 21349, 21093, 21091, 21089, 21085, 21084, 21063, 21062, 21060, 21053, 21050, 21036, 21037 and 21048, respectively), showed some homology to gene sequences previously identified in humans.

### Example 2

#### ISOLATION AND CHARACTERIZATION OF BREAST TUMOR POLYPEPTIDES OBTAINED BY PCR-BASED SUBTRACTION USING SCID-PASSAGED TUMOR RNA

Human breast tumor antigens were obtained by PCR-based subtraction using SCID mouse passaged breast tumor RNA as follows. Human breast tumor was implanted in SCID mice and harvested on the first or sixth serial passage, as described in Patent Application Serial No. 08/556,659 filed 11/13/95, U.S. Patent No. \_\_\_\_\_. Genes found to be differentially expressed between early and late passage SCID tumor may be stage specific and therefore useful in therapeutic and diagnostic applications. Total RNA was prepared from snap frozen SCID passaged human breast tumor from both the first and sixth passage.

PCR-based subtraction was performed essentially as described above. In the first subtraction (referred to as T9), RNA from first passage tumor was subtracted from sixth passage tumor RNA to identify more aggressive, later passage-specific antigens. Of the 64 clones isolated and sequenced from this subtraction, no significant homologies were found to 30 of these clones, hereinafter referred to as: 13053, 13057, 13059, 13065, 13067, 13068, 13071-13073, 13075, 13078, 13079, 13081, 13082, 13092, 13097, 13101, 13102, 13131, 13133, 13119, 13135, 13139, 13140, 13146-13149, and 13151, with the exception of some previously identified expressed sequence tags (ESTs). The determined cDNA sequences for these clones are provided in SEQ ID NO: 88-116,

respectively. The isolated cDNA sequences of SEQ ID NO: 117-140 showed homology to known genes.

In a second PCR-based subtraction, RNA from sixth passage tumor was subtracted from first passage tumor RNA to identify antigens down-regulated over multiple passages. Of the 36 clones isolated and sequenced, no significant homologies were found to nineteen of these clones, hereinafter referred to as: 14376, 14377, 14383, 14384, 14387, 14392, 14394, 14398, 14401, 14402, 14405, 14409, 14412, 14414-14416, 14419, 14426, and 14427, with the exception of some previously identified expressed sequence tags (ESTs). The determined cDNA sequences for these clones are provided in SEQ ID NO: 141-159, respectively. The isolated cDNA sequences of SEQ ID NO: 160-174 were found to show homology to previously known genes.

Further analysis of human breast tumor antigens through PCR-based subtraction using first and sixth passage SCID tumor RNA was performed. Sixty three clones were found to be differentially expressed by a two or more fold margin, as determined by microarray analysis, i.e., higher expression in early passage tumor over late passage tumor, or vice versa.. Seventeen of these clones showed no significant homology to any known genes, although some degree of homology with previously identified expressed sequence tags (ESTs) was found, hereinafter referred to as 20266, 20270, 20274, 20276, 20277, 20280, 20281, 20294, 20303, 20310, 20336, 20341, 20941, 20954, 20961, 20965 and 20975 (SEQ ID NO: 252-268, respectively). The remaining clones were found to share some degree of homology to known genes, which are identified in the Brief Description of the Drawings and Sequence Identifiers section above, hereinafter referred to as 20261, 20262, 20265, 20267, 20268, 20271, 20272, 20273, 20278, 20279, 20293, 20300, 20305, 20306, 20307, 20313, 20317, 20318, 20320, 20321, 20322, 20326, 20333, 20335, 20337, 20338, 20340, 20938, 20939, 20940, 20942, 20943, 20944, 20946, 20947, 20948, 20949, 20950, 20951, 20952, 20957, 20959, 20966, 20976, 20977 and 20978. The determined cDNA sequences for these clones are provided in SEQ ID NO: 269-313, respectively.

The clones 20310, 20281, 20262, 20280, 20303, 20336, 20270, 20341, 20326 and 20977 (also referred to as B820P, B821P, B822P, B823P, B824P, B825P, B826P, B827P, B828P and B829P, respectively) were selected for further analysis based

on the results obtained with microarray analysis. Specifically, microarray data analysis indicated at least two- to three-fold overexpression of these clones in breast tumor RNA compared to normal tissues tested. Subsequent studies led to the determination of the complete insert sequence for the clones B820P, B821P, B822P, B823P, B824P, B825P, B826P, B827P, B828P and B829P. These extended cDNA sequences are provided in SEQ ID NO: 416-426, respectively.

### Example 3

#### SYNTHESIS OF POLYPEPTIDES

Polypeptides may be synthesized on an Perkin Elmer/Applied Biosystems Division 430A peptide synthesizer using Fmoc chemistry with HPTU (O-Benzotriazole-N,N,N',N'-tetramethyluronium hexafluorophosphate) activation. A Gly-Cys-Gly sequence may be attached to the amino terminus of the peptide to provide a method of conjugation, binding to an immobilized surface, or labeling of the peptide. Cleavage of the peptides from the solid support may be carried out using the following cleavage mixture: trifluoroacetic acid:ethanedithiol:thioanisole:water:phenol (40:1:2:2:3). After cleaving for 2 hours, the peptides may be precipitated in cold methyl-t-butyl-ether. The peptide pellets may then be dissolved in water containing 0.1% trifluoroacetic acid (TFA) and lyophilized prior to purification by C18 reverse phase HPLC. A gradient of 0%-60% acetonitrile (containing 0.1% TFA) in water (containing 0.1% TFA) may be used to elute the peptides. Following lyophilization of the pure fractions, the peptides may be characterized using electrospray or other types of mass spectrometry and by amino acid analysis.

From the foregoing, it will be appreciated that, although specific embodiments of the invention have been described herein for the purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention.

## Claims

1. An isolated polypeptide comprising at least an immunogenic portion of a breast tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(a) sequences recited in SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468;

(b) sequences that hybridize to a sequence of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 under moderately stringent conditions; and

(c) a complement of a sequence of (a) or (b).

2. An isolated polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing polynucleotide sequences.

3. An isolated polypeptide comprising a sequence recited in any one of SEQ ID NO: 176, 179, 181 and 469-473.

4. An isolated polynucleotide encoding at least 15 contiguous amino acid residues of a breast tumor protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing sequences.

5. An isolated polynucleotide encoding a breast tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing sequences.

6. An isolated polynucleotide comprising a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468.

7. An isolated polynucleotide comprising a sequence that hybridizes to a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219,



222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 under moderately stringent conditions.

8. An isolated polynucleotide complementary to a polynucleotide according to any one of claims 4-7.

9. An expression vector comprising a polynucleotide according to any one of claims claim 4-7.

10. A host cell transformed or transfected with an expression vector according to claim 9.

11. An expression vector comprising a polynucleotide according claim 8.

12. A host cell transformed or transfected with an expression vector according to claim 11.

13. A pharmaceutical composition comprising a polypeptide according to claim 1, in combination with a physiologically acceptable carrier.

14. A vaccine comprising a polypeptide according to claim 1, in combination with an immunostimulant.

15. A vaccine according to claim 14, wherein the immunostimulant is an adjuvant.

16. A vaccine according to claim 14, wherein the immunostimulant induces a predominantly Type I response.

17. A pharmaceutical composition comprising a polynucleotide according to claim 4, in combination with a physiologically acceptable carrier.

18. A vaccine comprising a polynucleotide according to claim 4, in combination with an immunostimulant.

19. A vaccine according to claim 18, wherein the immunostimulant is an adjuvant.

20. A vaccine according to claim 18, wherein the immunostimulant induces a predominantly Type I response.

21. An isolated antibody, or antigen-binding fragment thereof, that specifically binds to a breast tumor protein that comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing polynucleotide sequences.

22. A pharmaceutical composition comprising an antibody or fragment thereof according to claim 18, in combination with a physiologically acceptable carrier.

23. A pharmaceutical composition comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with a pharmaceutically acceptable carrier or excipient.

24. A pharmaceutical composition according to claim 23, wherein the antigen presenting cell is a dendritic cell or a macrophage.

25. A vaccine comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with an immunostimulant.

26. A vaccine according to claim 25, wherein the immunostimulant is an adjuvant.

27. A vaccine according to claim 25, wherein the immunostimulant induces a predominantly Type I response.

28. A vaccine according to claim 25, wherein the antigen-presenting cell is a dendritic cell.

29. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a polypeptide according to claim 1, and thereby inhibiting the development of a cancer in the patient.

30. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a polynucleotide according to claim 4, and thereby inhibiting the development of a cancer in the patient.

31. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antibody or antigen-binding fragment thereof according to claim 21, and thereby inhibiting the development

of a cancer in the patient.

32. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antigen-presenting cell that expresses a polypeptide according to claim 1, and thereby inhibiting the development of a cancer in the patient.

33. A method according to claim 32, wherein the antigen-presenting cell is a dendritic cell.

34. A method according to any one of claims 29-32, wherein the cancer is breast cancer .

35. A fusion protein comprising at least one polypeptide according to claim 1.

36. A fusion protein according to claim 35, wherein the fusion protein comprises an expression enhancer that increases expression of the fusion protein in a host cell transfected with a polynucleotide encoding the fusion protein.

37. A fusion protein according to claim 35, wherein the fusion protein comprises a T helper epitope that is not present within the polypeptide of claim 1.

38. A fusion protein according to claim 35, wherein the fusion protein comprises an affinity tag.

39. An isolated polynucleotide encoding a fusion protein according to claim 35.

40. A pharmaceutical composition comprising a fusion protein according to claim 32, in combination with a physiologically acceptable carrier.

41. A vaccine comprising a fusion protein according to claim 35, in combination with an immunostimulant.

42. A vaccine according to claim 41, wherein the immunostimulant is an adjuvant.

43. A vaccine according to claim 41, wherein the immunostimulant induces a predominantly Type I response.

44. A pharmaceutical composition comprising a polynucleotide according to claim 40, in combination with a physiologically acceptable carrier.

45. A vaccine comprising a polynucleotide according to claim 40, in combination with an immunostimulant.

46. A vaccine according to claim 45, wherein the immunostimulant is an adjuvant.

47. A vaccine according to claim 45, wherein the immunostimulant induces a predominantly Type I response.

48. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a pharmaceutical composition according to claim 40 or claim 44.

49. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a vaccine according to claim 41 or claim 45.

50. A method for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

- (i) polynucleotides recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468; and
- (ii) complements of the foregoing polynucleotides;

wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the antigen from the sample.

51. A method according to claim 50, wherein the biological sample is blood or a fraction thereof.

52. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated according to the method of claim 50.

53. A method for stimulating and/or expanding T cells specific for a breast tumor protein, comprising contacting T cells with one or more of:

- (i) a polypeptide according to claim 1;
- (ii) a polynucleotide encoding such a polypeptide; and/or
- (iii) an antigen presenting cell that expresses such a polypeptide;

under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.

54. An isolated T cell population, comprising T cells prepared according to the method of claim 53.

55. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population according to claim 54.

56. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4<sup>+</sup> and/or CD8<sup>+</sup> T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- (ii) a polynucleotide encoding such a polypeptide; or
- (iii) an antigen-presenting cell that expresses such a

polypeptide;

such that T cells proliferate; and

(b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient.

57. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4<sup>+</sup> and/or CD8<sup>+</sup> T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- (ii) a polynucleotide encoding such a polypeptide; or
- (iii) an antigen-presenting cell that expresses such a

polypeptide;

such that T cells proliferate;

(b) cloning at least one proliferated cell; and

(c) administering to the patient an effective amount of the cloned T cells, and thereby inhibiting the development of a cancer in the patient.

58. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with a binding agent that binds to a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468; and

(ii) complements of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent; and

(c) comparing the amount of polypeptide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

59. A method according to claim 58, wherein the binding agent is an antibody.

60. A method according to claim 59, wherein the antibody is a monoclonal antibody.

61. A method according to claim 58, wherein the cancer is breast cancer.

62. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent;

(c) repeating steps (a) and (b) using a biological sample obtained from



the patient at a subsequent point in time; and

(d) comparing the amount of polypeptide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

63. A method according to claim 62, wherein the binding agent is an antibody.

64. A method according to claim 63, wherein the antibody is a monoclonal antibody.

65. A method according to claim 62, wherein the cancer is a breast cancer.

66. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; and

(c) comparing the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

67. A method according to claim 66, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

68. A method according to claim 66, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

69. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide;

(c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polynucleotide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

70. A method according to claim 69, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

71. A method according to claim 69, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

72. A diagnostic kit, comprising:

- (a) one or more antibodies according to claim 21; and
- (b) a detection reagent comprising a reporter group.

73. A kit according to claim 72, wherein the antibodies are immobilized on a solid support.

74. A kit according to claim 73, wherein the solid support comprises nitrocellulose, latex or a plastic material.

75. A kit according to claim 72, wherein the detection reagent comprises an anti-immunoglobulin, protein G, protein A or lectin.

76. A kit according to claim 72, wherein the reporter group is selected from the group consisting of radioisotopes, fluorescent groups, luminescent groups, enzymes, biotin and dye particles.

77. An oligonucleotide comprising 10 to 40 contiguous nucleotides that hybridize under moderately stringent conditions to a polynucleotide that encodes a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing polynucleotides.

78. A oligonucleotide according to claim 77, wherein the oligonucleotide comprises 10-40 contiguous nucleotides recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468.

79. A diagnostic kit, comprising:

- (a) an oligonucleotide according to claim 77; and
- (b) a diagnostic reagent for use in a polymerase chain reaction or hybridization assay.

## SEQUENCE LISTING

<110> Corixa Corporation  
 Yuqui, Jiang  
 Dillon, Davin C.  
 Mitcham, Jennifer L.  
 Xu, Jiangchun  
 Harlocker, Susan L.

<120> COMPOSITIONS FOR THE TREATMENT AND  
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&lt;210&gt; 26

&lt;211&gt; 301

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 26

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t						301

&lt;210&gt; 27

&lt;211&gt; 301

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 27

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&lt;210&gt; 28

&lt;211&gt; 286

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 28

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&lt;210&gt; 29

&lt;211&gt; 301

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 29

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&lt;210&gt; 30

&lt;211&gt; 332

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 30

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&lt;210&gt; 31

&lt;211&gt; 141

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 31

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&lt;210&gt; 32

&lt;211&gt; 201

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 32

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gggtaaacct tttcagggag g	201

&lt;210&gt; 33

&lt;211&gt; 181

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 33

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c	181

&lt;210&gt; 34

&lt;211&gt; 151

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 34

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&lt;210&gt; 35

&lt;211&gt; 291

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 35

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&lt;210&gt; 36

&lt;211&gt; 201

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 36

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gtgaaacaca caagccaatc cggaactgct gtgcgaaaga taaaatcgag aaaggcaagg	180
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&lt;210&gt; 37

&lt;211&gt; 121

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 37

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c	121

&lt;210&gt; 38

&lt;211&gt; 200

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 38

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&lt;210&gt; 39

&lt;211&gt; 760

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 39

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&lt;210&gt; 40

&lt;211&gt; 452

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 40

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&lt;210&gt; 41

&lt;211&gt; 676

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 41

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&lt;210&gt; 42

&lt;211&gt; 468

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 42

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&lt;210&gt; 43

&lt;211&gt; 408

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 43

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&lt;210&gt; 44

&lt;211&gt; 160

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 44

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&lt;210&gt; 45

&lt;211&gt; 231

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 45

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&lt;210&gt; 46

&lt;211&gt; 371

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 46

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 <213> Homo sapien

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 tgcacagcac aatccatgat gcgttttctc cccttacgca ctttgaaacc catgctagaa 240  
 aagtgaatac atctgactgt gctccactcc aacctccagc gtggatgtcc ctgtctgggc 300  
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 cga 363

<210> 58  
 <211> 750  
 <212> DNA  
 <213> Homo sapien

<400> 58  
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 gtggcccttc ttcaggaaag agcaaataag ttggtccaag tacttgatgc ttaaggaata 180  
 cacaaagggtg cccatcaagc gctcagaaat gctgagagat atcatccgtg aatacactga 240

tgtttatcca	gaaatcattg	aacgtgcatg	ctttgtccta	gagaagaaat	ttgggattca	300
actgaaagaa	attgacaaa	aagaacacct	gtatattctc	atcagraccc	ccgagtcctt	360
ggctggcata	ctgggaacga	ccaaagacac	acccaagctc	ggctctctct	tggtgattct	420
gggtgtcatc	ttcatgaatg	gcaaccgtgc	cagtgaggct	gtcttttggg	aggcactacg	480
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tcacctatga	gtttgtaaa	gagaaatacc	tggactacag	acgagtgtcc	aacagcaacc	600
ccccggagta	tgagttcctc	tggggcctcc	gtccctacca	tgagactagc	aagatgaaaa	660
tgctgagatt	cattgcagag	gttcagaaaa	gagaccctcg	tgactggact	gcacagttca	720
tggaggctgc	agatgaggac	ctgcccgggc				750

<210> 59  
 <211> 505  
 <212> DNA  
 <213> Homo sapien

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aagtgaacc	tggtcacatc	agggcacatt	cagcagcaga	agtctgtttc	cagtatagtc	180
cttggatagg	ctaaaattcca	ctgtcccttt	ctcagcagtc	aataatccat	gataaattct	240
gtacaacact	gtagtcaata	acagcagcac	cagacagcat	attaattctt	ttaccataaa	300
tttgtgtgta	attataatgt	tctatgtgtg	gtgttatcaa	aagaatcact	gtgtctctaa	360
atatcatata	tgtatgtctg	gataaatata	ttgctgtaca	acatctccaa	catgcaggtc	420
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gctaagggcg	aattctgcag	atata				505

<210> 60  
 <211> 520  
 <212> DNA  
 <213> Homo sapien

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tcattgcctg	cccttgctgg	agggctgatt	ttagtgttgc	ttattatgtt	ggccctgagg	180
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cactacagct	ttcacggaca	ccattccaaa	aaggggcagg	ttgcaaagtt	agacttggaa	300
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gcagacctca	gcaacgataa	gacccctctg	cttgttcact	ggggcatgta	cagtgggcac	420
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ggacctgccc	gggcggccgc	tcgaaagggg	cgaattctgc			520

<210> 61  
 <211> 447  
 <212> DNA  
 <213> Homo sapien

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tcttttttcc	cgttggttta	tttgtagtcc	ttgggcaaac	caatgtcttt	gttcgaaaga	180
gggaaaataa	tccaaacgtt	tttcttttaa	cttttttttt	aggttcaggg	gcacatgtgt	240
aggcttgcta	tataggtaaa	ttgcatgtca	ccagggtttg	ttgtacagat	tatttcatca	300
tccagataaa	aagcatagta	ccagataggt	agttttttga	tcctcaccct	ccttccatgc	360
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tctgcagata tccatcacac tggccgg

447

&lt;210&gt; 62

&lt;211&gt; 83

&lt;212&gt; PRT

&lt;213&gt; Homo sapien

&lt;400&gt; 62

Lys Lys Val Leu Leu Leu Ile Thr Ala Ile Leu Ala Val Ala Val Gly  
 1 5 10 15  
 Phe Pro Val Ser Gln Asp Gln Glu Arg Glu Lys Arg Ser Ile Ser Asp  
 20 25 30  
 Ser Asp Glu Leu Ala Ser Gly Phe Val Phe Pro Tyr Pro Tyr Pro  
 35 40 45  
 Phe Arg Pro Leu Pro Pro Ile Pro Phe Pro Arg Phe Pro Trp Phe Arg  
 50 55 60  
 Arg Asn Phe Pro Ile Pro Ile Pro Ser Ala Pro Thr Thr Pro Leu Pro  
 65 70 75 80  
 Ser Glu Lys

&lt;210&gt; 63

&lt;211&gt; 683

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 63

acaaagattg gtagctttta tattttttta aaaatgctat actaagagaa aaaacaaaag 60  
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 ccaactaaaa aaaatattga aaccactttt gattgaagca aaatgaataa tgctagattt 180  
 aaaaacagtg tgaaatcaca ctttggtctg taaacatatt tagctttgct tttcattcag 240  
 atgtatacat aaacttattt aaaatgtcat ttaagtgaac cattccaagg cataataaaa 300  
 aaagwggtag caaatgaaaa ttaaagcatt tattttggta gttcttcaat aatgatrcga 360  
 gaaactgaat tccatccagt agaagcatct ccttttgggt aatctgaaca agtrccaacc 420  
 cagatagcaa catccactaa tccagcacca attccttcac aaagtccttc cacagaagaa 480  
 gtgcgatgaa tattaattgt tgaattcatt tcagggcttc cttggtccaa ataaattata 540  
 gcttcaatgg gaagaggtcc tgaacattca gctccattga atgtgaaata ccaacgctga 600  
 cagcatgcat ttctgcattt tagccgaagt gagccactga acaaaactct tagagcacta 660  
 tttgaacgca tctttgtaaa tgt 683

&lt;210&gt; 64

&lt;211&gt; 749

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(749)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 64

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 tatttgtcat ttgtatttat tatctctgtg ttttccccct aaggcataaa atggtttact 180  
 gtgttcattt gaaccattt actgatctct gttgtatatt tttcatgcca ctgctttgtt 240

ttctcctcag	aagtcgggta	gatagcattt	ctatcccatc	cctcacgtta	ttggaagcat	300
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aagcattgat	tgagacattt	gcacaatcta	aaatgtaagc	aaagtaagtc	attaaaaata	420
caccctctac	ttgggcttta	tactgcatac	aaatttactc	atgagccttc	ctttgaggaa	480
ggatgtggat	ctccaaataa	agatttagtg	tttattttga	gctctgcata	ttancaagat	540
gatctgaaca	cctctccttt	gtatcaataa	atagccctgt	tattctgaag	tgagaggacc	600
aagtatagta	aaatgctgac	atctaaaact	aaataaatag	aaaacaccag	gccagaacta	660
tagtcatact	cacacaaagg	gagaaattta	aactcgaacc	aagcaaaagg	cttcacggaa	720
atagcatgga	aaaacaatgc	ttccagtgg				749

&lt;210&gt; 65

&lt;211&gt; 612

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 65

acagcagcag	tagatggctg	caacaacctt	cctcctaccc	cagcccagaa	aatattttctg	60
ccccacccca	ggatccggga	ccaaaataaa	gagcaagcag	gcccccttca	ctgagggtgct	120
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ggagagacca	tttggcgcca	gtcccctagg	agatgggagg	aggagagatag	gtatgagggt	300
aggcgctaag	aagagtagga	ggggtccact	ccaagtggca	gggtgctgaa	atgggctagg	360
accaacagga	cactgactct	agggttatga	cctgtccata	cccgttccac	agcagctggg	420
tgggagaaat	caccattttg	tgactttctaa	taaaataatg	ggtctaggca	acagttttca	480
atggatgcta	aaacgattag	gtgaaaagtt	gatggagaat	tttaattcag	gggaattagg	540
ctgataccat	ctgaaaccat	ttggcatcat	taaaaatgtg	acaacctggg	ggctgccagg	600
gaggaagggg	ag					612

&lt;210&gt; 66

&lt;211&gt; 703

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 66

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gtagctcagc	tccgccagct	gcagacgcta	attgctcaaa	cttccaacaa	agctgcccag	180
accagcactt	gtgttttgat	tcttcttttt	tccctggctc	tcatcctcct	gccagcttc	240
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gagaagatgg	gaggggaagcc	aagaccaggt	gggcgcctcc	ggtccgtgct	gcatgcagat	480
gagatgtgag	ctggaacaga	ccttcctggc	ccacttcctg	atcacaagga	atcctgggct	540
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&lt;210&gt; 67

&lt;211&gt; 1022

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 67

cttgagaaag	caggattggt	ttaagttcca	agatttaaca	aacttactgt	tcagcatcat	60
attcaagcct	aaaaggaaga	taggattttc	aagatatatt	tccaacttct	ttaacatggc	120

18

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accatggatg aactgtttct cagcactgtg ctgcttcact tggaaattaag gatgaattgg 180
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cctcaactcc actccagctg ttctgttcc acacgggtcca ctgagctggc ccagtccttt 300
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ct 1022

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<210> 68
<211> 449
<212> DNA
<213> Homo sapien

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<400> 68
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agagatttcc tgggtctgcc agaggccag acaggctcac tcaagctctt taactgaaaa 180
gcaacaagcc actccaggac aaggttcaaa atggttacaa cagcctctac ctgtcgcccc 240
agggagaaaag gggtagtgat acaagtctca tagccagaga tgggttttcca ctcttctag 300
atattcccaa aaagaggctg agacaggagg ttattttcaa ttttattttg gaattaaata 360
cttttttccc tttattactg ttgtagtcct tcacttggat atacctctgt tttcacgata 420
gaaataaggg aggtctagag cttctattc 449

```

```

<210> 69
<211> 387
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1) ... (387)
<223> n = A,T,C or G

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<400> 69
gcccttagcg tgggtcgcg cncgangtct ggagcntatg tgatnccat ggtncncagg 60
cnnatactgc tantctcatt tattctcctg cnacctantc ctctnctctg gaatcacacc 120
attattgcct gttaacactg gactgtgagt accangcaat taatttgcac caanaaagtt 180
gagggtatta tcanatattg caatctgtac agaggggaaga tgatttcaat ttgatttcaa 240
cttaaccttc atctttgtct gttaacacta atagaggggtg tctaataaaa tggcaaattt 300
ngatctcat tnggtataac tacactcttt ttcacagatg tgatgactga atttccanca 360
acctgcccgg gcggncgntc naagggc 387

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```

<210> 70
<211> 836
<212> DNA
<213> Homo sapien

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&lt;400&gt; 70

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accctagttt	atattttat	agatatctgt	ttacaaagtc	tgtagttaa	cctgatgctg	180
accatctgaa	atgtactttt	tttctgaatg	ctgtttcaat	ctaaaatagc	agcttttgag	240
aaaacaatga	tgtaaattcc	ttatgataaa	aggatgattc	tatatattct	ttaatgatat	300
taaatatgcc	gaagccaagc	acacagtcct	tctaaagtgt	gtgtatgttt	gtgtgaatgt	360
gaatgatact	gatcttatat	ctgtttaaag	ttgtttttaa	aagctgtggc	atcccattgt	420
tcatatttgc	caagtcttct	gtaaagatgt	ctaggacgaa	atattttatg	tgctaatagca	480
tgtatttgta	aaccagattt	gtttaccact	caaaattaac	ttgttttctt	catccaaaaa	540
agtttatctt	ttccacgtac	ttaaattttc	tgtgtgggta	taatatagct	ttctaatttt	600
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gctcagcagt	ttaacatgtg	aatcctgttt	taaagtgttc	agatttcaac	tgtgtaagcc	780
attgatataa	cgctgtaatt	aaaaatgttt	atatgaaaaa	aaaaaaaaaa	aaaaaa	836

&lt;210&gt; 71

&lt;211&gt; 618

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 71

gttgacagtga	gctcaagtgt	tgggtgtatc	agctcaaaac	accatgtgat	gccaatcatc	60
tccacaggag	caatttggtt	accttttttt	tctgatgctt	tactaacttc	atctttttaga	120
tttaaatcat	tagtagatcc	tagaggagcc	agtttcagaa	aatatagatt	ctagttcagc	180
accaccgta	gttgtgcatt	gaaataatta	tcattatgat	tatgtatcag	agcttctggg	240
tttctcattc	tttattcatt	tattcaacaa	ccacgtgaca	aacactggaa	ttacaggatg	300
aagatgagat	aatccgctcc	ttggcagtg	tatactatta	tataacctga	aaaaacaaac	360
aggtaatttt	cacacaaagt	aatagatatc	atgacacatt	taaaataggg	cactactgga	420
acacacagat	aggacatcca	ggttttgggt	caatattgta	gacttttttg	tggaatgagat	480
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gccaaagagct	ggagctgagg	aagatcactg	tgaatttcta	tgtagtctag	ttggctggat	600
gctagagcaa	agaggtgg					618

&lt;210&gt; 72

&lt;211&gt; 806

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 72

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ccctttaatg	ggattgaaa	cacttttacc	acatggagaa	atatattttt	aatttgat	660
gcttttctac	aaggtccact	atttctgagt	ttaatgtgtt	tccaacactt	aaggagactc	720
taatgaaagc	tgatgaattt	tcttttctgt	ccaaacaagt	aaaataaaaa	taaaagtcta	780
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20

<210> 73  
 <211> 301  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(301)  
 <223> n = A,T,C or G

<400> 73  
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 agtcctttca ggctagctgc atcaactctg ctgattttgt tgccatcaag atgtaattcc 180  
 gtaaggggaag gaggaagacc ttgaggaatg ctggygatat tggatcagc aatgcggatg 240  
 tasgaagagc ttcttcttcc cctggaaagc cccattttca atyccttgag ctcttcakcg 300  
 g 301

<210> 74  
 <211> 401  
 <212> DNA  
 <213> Homo sapien

<400> 74  
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 agtgtgttct ggatacagag cacatcgtgg cttctggggg cactcagc ttaggctgtg 120  
 ggtccacaga gcaactcatc ggctgggcta tgggtgggtt ggctctactc aagaagcaaa 180  
 gcagttacca gcacattcaa acagtgtatt gaacatcttt taaatatcaa agtgagaaac 240  
 aagaaggcaa cataataatg ttatcagaaa gatgttagga agtaaggaca gctgtgtaaa 300  
 gcttgaggct gaaaagtagc ttgccagctt ctttctttt gtttcttggg tagtgggccg 360  
 ccggaacagc aagatgtgag gttctggttc atggatcata t 401

<210> 75  
 <211> 612  
 <212> DNA  
 <213> Homo sapien

<400> 75  
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 gatgtgcaga agaaatggaa ggattcagct ttcagttaaa aaagaagaag aagaaatggc 240  
 aaagagaaaag ttttttcaaa tttctttctt ttttaattta gattgagttc atttatttga 300  
 aacagactgg gccaatgtcc acaaagaatt cctggtcagc accaccgatg tccaaagggtg 360  
 caatatcaag gaagggcagg cgtgatggct tatttgtttt gtattcaatg attgtctttc 420  
 cccattcatt tgtcttttta gagcagccat ctacaagaac agtgtaagtg aacctgctgt 480  
 tgccctcagc aacaagttca acatcattag agccctgtag aatgacagcc tttttcaggt 540  
 tgccagtctc ctcatccatg tatgcaatgc tgttcttgca gtggtagggtg atgttctgag 600  
 aggcatagtt gg 612

<210> 76  
 <211> 844  
 <212> DNA  
 <213> Homo sapien



&lt;400&gt; 76

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gcagagacct	gaaattctgc	catcctgaac	tcaagagtgg	agaatactgg	gttgacccta	120
accaaggatg	caaattggat	gctatcaagg	tattctgtaa	tatggaaact	ggggaaacat	180
gcataagtgc	caatcctttg	aatgttccac	ggaaacactg	gtggacagat	tctagtgtcg	240
agaagaaaca	cgtttggttt	ggagagtcca	tggatgggtg	ttttcagttt	agctacggca	300
atcctgaact	tcctgaagat	gtccttgatg	tgcagcykgc	attccttcga	cttctctcca	360
gccgagcttc	ccagaacatc	acatatcact	gcaaaaatag	cattgcatac	atggatcagg	420
ccagtggaaa	tgtaaagaag	gccctgaagc	tgatggggtc	aaatgaaggt	gaattcaagg	480
ctgaaggaaa	tagcaaattc	acctacacag	ttctggagga	tggttgacag	aaacacactg	540
gggaatggag	caaaacagtc	tttgaatatc	gaacacgcaa	tgctgttcct	tgacattgca	600
ccaccaatgt	ccagagggtg	aatgtcaagg	aacggcaggc	gagatggctt	atgtgttttg	660
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gagtaggtga	acctgctgtt	gccctcagca	acaagttcca	catcggtgga	acctgtcaga	780
agcacagcct	tgttcaarct	gcccgtctcc	tcattccagat	acctcggccg	cgaccacgct	840
aatc						844

&lt;210&gt; 77

&lt;211&gt; 314

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 77

ccagtctctc	acttggcctg	atgagagtgg	ggagtggcaa	gggacgtttc	tcctgcaata	60
gacacttaga	tttctctctt	gtgggaagaa	accacctgtc	catccactga	ctcttctaca	120
ttgatgtgga	aattgctgct	gctaccacca	cctcctgaag	aggcttccct	gatgccaatg	180
ccagccatcc	tggcatcctg	gccctcgagc	aggctgcggt	aagtagcgat	ctcctgctcc	240
agccgtgtct	ttatgtcaag	cagcatcttg	tactcctggg	tctgagcctc	catctcgcat	300
cggagctcac	tcag					314

&lt;210&gt; 78

&lt;211&gt; 548

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 78

accaagagcc	aagtgttaca	caggatattt	taaaaataaa	atgttttttg	aatcctcacc	60
tcccatgcta	tcttctaaga	taactacaaa	tattcttcaa	agatttaact	gagttctgcc	120
aaggacctcc	caggactcta	tccagaatga	ttattgtaaa	gctttacaaa	tcccaccttg	180
gccctagcga	taattaggaa	atcacaggca	aacctcctct	ctcggagacc	aatgaccagg	240
ccaatcagtc	tgcacattgg	ttttgttaga	tactttgtgg	agaaaaacaa	aggctcgtga	300
tagtgcagct	ctgtgcctac	agagagcctc	ccttttggtt	ctgaaattgc	tgatgtgaca	360
gagacaaagc	tgctatgggt	ctaaaacctt	caataaagta	actaatgaca	ctcaagggtcc	420
tgggactctg	agacagacgg	tggtaaaacc	cacagctgcg	attcacattt	ccaattttatt	480
ttgagctctt	tctgaagctg	ttgcttccta	cctgagaatt	cccattttaga	gagctgcaca	540
gcacagtc						548

&lt;210&gt; 79

&lt;211&gt; 646

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 79

accccgctac	tatgtgaata	aaggcagcta	gaaaatggac	tcaattctgc	aagccttcac	60
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```

ggcaacagcc catattaaga cttctagaac aagttaaaaa aaatcttcca tttccatcca 120
tgcattgggaa aagggcttta gtatagttta ggatggatgt gtgtataata ataaaatgat 180
aagatatgca tagtggggga ataaagcctc agagtccttc cagtatgggg aatccattgt 240
atcttagaac cgagggattt gtttagattg ttgatctact aatttttttc ttcacttata 300
tttgaatttt caatgatagg acttattgga aattggggat aattctgttg tggattataa 360
taatattcat tttttaaaaa ctcatcttgg tattgagtta gtgcattgac ttccaatgaa 420
ttgacataag cccatatttc attttaacca gaaacaaaaa ctagaaaatg ttactcccta 480
aataggcaac aatgtatttt ataagcactg cagagattta gtaaaaaaca tgtatagtta 540
ctttagaaac aacttctgac acttgagggt tacccaatgg tctccttccc attctttata 600
tgaggtaaat gcaaaccagg gagccaccga ataaacagcc ctgagt 646

```

&lt;210&gt; 80

&lt;211&gt; 276

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(276)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 80

```

gtctgaatga gcttcnctgc gagatgganc ancataaccc agaantccaa aancntanng 60
aacgnnaaaa cccgntngaa caagnaaacn gcaactnacg gccgcctgnt gnagggcgag 120
gacgccacc tctcctcttc ccagttcttc tctggatcgc agncatccan agatgtgacc 180
tcttcagcc gccaaatccg caccaagggtc atggatgtgc acgatggcaa ggtgggtgtc 240
caccacgaa caggtccttc gcaccaagaa ctgagg 276

```

&lt;210&gt; 81

&lt;211&gt; 647

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 81

```

gtcctgcctt tcatcttttc tttaaaaaaa ataaatgttt aaaaaacatt tccctcagat 60
tttaaaattc atggaagtaa taaacagtaa taaaatatgg atactatgaa aactgacaca 120
cagaaaaaca taaccataaa atattgttcc aggatacaga tattaattaa gagtgaattc 180
gttagcaaca cgtagacatt catacatatc cggtggaaga ctggtttctg agatgcgatt 240
gccatccaaa cgcaaagtgt tgatcttgga gtaggrtaat ggcccagga tcttgcaaaa 300
gctctttatg tcaaacttct caagttgatt gacctccagg taatagtttt caaggttttc 360
attgacagtt ggtatgtttt taagcttggt ataggacaga tccagctcaa ccagggatga 420
cacattgaaa gaatttccag gtattccact atcagccagt tcgttgtag ataaacgcag 480
atactgcaat gcattaaaac gcttgaaata ctcatcaggg atgttgctga tcttattgtt 540
gtctaagtag agagttagaa gagagacagg gagaccagaa ggcagtctgg ctatctgatt 600
gaagctcaag tcaaggtatt cgagtgtatt aagaccttta aaagcag 647

```

&lt;210&gt; 82

&lt;211&gt; 878

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 82

```

ccttcttttc ccaactcaatt cttcctgccc tgttattaat taagatatct tcagcttgta 60
gtcagacaca atcagaatya cagaaaaatc ctgcctaagg caaagaaata taagacaaga 120
ctatgatatc aatgaatgtg ggttaagtaa tagattttcca gctaaattgg tctaaaaaa 180

```

```

aatattaagt gtggacagac ctatttcaaa ggagcttaat tgatctcact tgttttagtt      240
ctgatccagg gagatcaccc ctctaattat ttctgaactt ggtaataaaa agtttataag      300
atttttatga agcagccact gtatgatatt ttaagcaa atgttattta aaatattgat      360
ccttcccttg gaccaccttc atgttagttg ggtattataa ataagagata caaccatgaa      420
tatattatgt ttatacaaaa tcaatctgaa cacaattcat aaagatttct cttttatacc      480
ttcctcactg gccccctcca cctgcccata gtcaccaa atctgtttta atcaatgacc      540
taagatcaac aatgaagtat ttataaaatg tatttatgct gctagactgt ggggtcaaatg      600
tttccatttt caaattattt agaattctta tgagtttaaa atttgtaa atctaaatcc      660
aatcatgtaa aatgaaactg ttgctccatt ggagtagtct cccacctaaa tatcaagatg      720
gctatatgct aaaaagagaa aatatggtca agtctaaaat ggctaattgt cctatgatgc      780
tattatcata gactaatgac atttatcttc aaaacaccaa attgtcttta gaaaaattaa      840
tgtgattaca ggtagagaac ctcgccgcgc accacgct      878

```

<210> 83  
 <211> 645  
 <212> DNA  
 <213> Homo sapien

```

<400> 83
acaaacattt tacaaaaaag aacattacca atatcagtgg cagtaagggc aagctgaaga      60
ataaatagac tgagtttccg ggcaatgtct gtcctcaaag acatccaaac tgcgttcagg      120
cagctgaaac aggcttcttt cccagtgaac agcatatgtg gtcagtaata caaacgatgg      180
taaattgaggc tactacatag gccagtttaa caaactcctc ttctcctcgg tagggccatg      240
atacaagtgg aactcatcaa ataatttaaa cccaaggcga taacaacgct atttcccatc      300
taaactcatt taagccttca caatgtcgca atggattcag ttacttgcaa acgatcccgg      360
gttgtcatac agatacttgt tttacacat aacgctgtgc catcccttcc ttcaactgcc      420
cagtcagggt tctgttgtt ggaccgaaag gggatacatt ttagaatgc ttccctcaag      480
acagaagtga gaaagaaagg agaccctgag gccaggatct attaaacctg gtgtgtgcgc      540
aaaagggagg gggaaggcag gaatttgaaa ggataaacgt ctcctttgcg ccgaggaatc      600
aggaagcgtg actcacttgg gtctgggacg ataccgaaat ccggt      645

```

<210> 84  
 <211> 301  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1) ... (301)  
 <223> n = A,T,C or G

```

<400> 84
tctgatgtca atcacaactt gaaggatgcc aatgatgtac caatccaatg tgaaatctct      60
cctcttatct cctatgctgg agaaggatta gaaggttatg tggcagataa agaattccat      120
gcacctctaa tcatcgatga gaatggagtt catgggctgg tgaaaaatgg tatttgaacc      180
agataccaag ttttgtttgc cacgatagga atagctttta tttttgatag accaactgtg      240
aacctacaag acgtcttga caactgaagn ttaaataatcc acangggttt attttgcttg      300
g      301

```

<210> 85  
 <211> 296  
 <212> DNA  
 <213> Homo sapien

<220>

<221> misc\_feature  
<222> (1)...(296)  
<223> n = A,T,C or G

<400> 85  
agcgtgggtc gcggcncgan gtagagaacc gactgaaacg tttgagatga agaaagtctt 60  
cctcctgac acagccatct tggcagtggtc tgttggtttc ccagtctctc aagaccagga 120  
acgagaaaaa agaagtatca gtgacagcga tgaattagct tcagggtttt ttgtgttccc 180  
ttacccatat ccatttcgcc cacttccacc aattccattt ccaagatttc catggtttan 240  
acgtaatttt cctattccaa tacctgaatc tgcccctaca actccccttc ctagcg 296

<210> 86  
<211> 806  
<212> DNA  
<213> Homo sapien

<400> 86  
tctacgatgg ccatttgctc attgtctttc ctctgtgtgt agtgagtgc cctggcagtg 60  
tttgctgct cagagtggcc cctcagaaca acagggtgg ccttggaata accccaaaac 120  
aggactgtgg tgacaactct ggctcaggtgt gatttgacat gagggccgga ggcggttgct 180  
gacggcagga ctggagaggc tgcgtgcccgc gactggcag cgaggctcgt gtgtccccc 240  
ggcagatctg ggcactttcc caaccaggt ttatgccgtc tccagggaag cctcggtgcc 300  
agagtgggtg gcagatctga ccatccccac agaccagaaa caaggaattt ctgggattac 360  
ccagtcccc ttcaaccag ttgatgtaac cactctcatt tttacaaata cagaatctat 420  
tctactcagg ctatgggctt cgtcctcact cagttattgc gagtgttgct gtccgcagtc 480  
tccgggcccc acgtggctcc tgtgctctag atcatgggtg ctcccccgcc ctgtggttg 540  
aatcgatgcc acggattgca ggccaaattt cagatcgtgt ttccaaacac ccttgctgtg 600  
ccctttaatg ggattgaaag cacttttacc acatggagaa atatattttt aatttgtgat 660  
gcttttctac aaggtccact atttctgagt ttaatgtgtt tccaacactt aaggagactc 720  
taatgaaagc tgatgaattt tcttttctgt ccaaacaagt aaaataaaaa taaaagtcta 780  
tttagatgtt gaaaaaaaa aaaaaa 806

<210> 87  
<211> 620  
<212> DNA  
<213> Homo sapien

<400> 87  
tttttgcac agatctgaaa tgtctgagag taatagtttc tgttgaattt ttttttgttc 60  
atttttctgc acagtccatt ctgtttttat tactatctag gcttgaaata tatagtttga 120  
aattatgaca tccttcctct ttgttatttt cctcatgatt gctttggcta ttcaaagttt 180  
attttagttt catgtaaaatt tttgaattgt attttccatt attgtgaaaa tagtaccact 240  
gcaattttta taggaagttt attgaatcta tagattactt tggataatat ggcacttcaa 300  
taatattcat gttttcaatt catagacaaa atattttaaa atttatttgt atcttttcta 360  
atttttcctt tttttattgt aaagatttac ctccctgggt aatattttcc tcagaaattt 420  
attatttaag gtatagtcaa taaaattttc ttcctctatt ttgtcagata gtttaagtgt 480  
atgaaccat agatatactt gtatgttaat tttatatttt gctaatttac tgagtgtatt 540  
tattagttta gagaggtttt aatgtactgt ttatggtttt ttaaataata gattacttat 600  
tttttaaaaa aaaaaaaaaa 620

<210> 88  
<211> 308  
<212> DNA  
<213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(308)  
 <223> n = A,T,C or G

<400> 88  
 tagctgtgnt cagcaggccg aggttttttt tttttttgag atggagtctc gccctgtcac 60  
 ccaggctgga gtgcagtggc ctgatctcag ctcaactgaa gctccacctc ctggattcac 120  
 gctattctcc tgcctcagcc tcccaagtag ctgggactac aggcgcccgc caccacgccc 180  
 agctaattnt ttgnattttt agtacnagat gcgggtttcat cgtgttagcc agcatggnc 240  
 cgatctcctg acctcgtgaa ctgcccgcct cggcctccca aagacctgcc cgggcngggc 300  
 gctcgaaa 308

<210> 89  
 <211> 492  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(492)  
 <223> n = A,T,C or G

<400> 89  
 agcggccgcc cgggcaggctc tgttaagtaa catacatatc accttaataa aaatcaagat 60  
 gaaatgtttt agaaactatt ttatcaaaag tggctctgat acaaagactt gtacatgatt 120  
 gttcacagca gcactattaa tgccaaaag tagacaaaac ctaaatgtcc attaatgat 180  
 aagcaaaatg tggatatatcc atacaatgga atattatgta gcccacaaca tggcatggag 240  
 tactacaaca tggatgagcc tcaaaaacgt tatgctaaat gaaaaaagtc agatatagga 300  
 aaccacatgt catatgatcc catttatatg aaatagccag aaaaggcaag tcatagaaac 360  
 aagatagatc ggaaaatggg ttggaggact acaaatggca ccagggatct ttgaagttga 420  
 tggaaatggt ctaaaatcag actgtggntg tggttgaaca agtctgtaaa tttacaaaaa 480  
 tgcgttaata ca 492

<210> 90  
 <211> 390  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(390)  
 <223> n = A,T,C or G

<400> 90  
 tcgagcggcc gcccgggcag gtacaagctt tttttttttt tttttttttt ttttctaaca 60  
 gttctctgtt ttattgcaat acagcaaagt ctggttaata ttaagngata tcaacataaa 120  
 gtattggtga ggagtctttt gtgacatttt ttaccatccc accttaataa tttctgtgca 180  
 aaanaatcca catcattgtt tggatancana ggatctctta aaaagttccc taanacactg 240  
 agggcataaa accaaacaaa ataaaataag gagtgatagg ctaaagcagt atcttcccct 300  
 ccatccacat ttgncaagca ttatattcta accaaaaaat gatcacacca ggccatgcaa 360  
 aactgtccaa tattaccgag aaaaaaccct 390

<210> 91  
 <211> 192

26

<212> DNA  
 <213> Homo sapien

<400> 91  
 agcgtggtcg cggccgaggt ctgtcaatta atgctagtcc tcaggattta aaaaataatc 60  
 ttaactcaaa gtccaatgca aaaacattaa gttggtaatt actcttgatc ttgaattact 120  
 tccgttacga aagtccttca cttttttcaa actaagctac tatatttaag gcctgcccgg 180  
 gcggccgctc ga 192

<210> 92  
 <211> 570  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(570)  
 <223> n = A,T,C or G

<400> 92  
 agcgtggtcg cggccgaggt ctgacaacta acaaagaagc aaaaactggc atcttggaca 60  
 tcctagtatt acacttgcaa gcaattagaa cacaaggagg gccaaaggaaa aagtttagct 120  
 ttgaatcact tccaaatcta ctgattttga ggttccgcag tagttctaac aaaacttttc 180  
 agacaatggt aacttttcgat taagaaagaa aaaaacccca aacatcttca ggaattccat 240  
 gccaggttca gtctcttcca gtgagcccgc ttgctaaaag tccacgtgca ccattaatta 300  
 gctgggctgg cagcaccatg taaaaagaag cctattcacc accaaccaca cagactagac 360  
 atgtaaagta ggatcaagta atggatgaca accatggctc tggaatatgg tcaatgagag 420  
 tcagaaaagt acaggcacca gtacaagcag cagataacag aattgacggg ccaaaggata 480  
 aaaataggct tatttaataa ggatgctaca gaacacatnc acttctaatt ggaagctgct 540  
 ttacactggg tggcattgna ccatatgcat 570

<210> 93  
 <211> 446  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(446)  
 <223> n = A,T,C or G

<400> 93  
 tcgagcggcc gcccgggcag gtccagggtt ttatttagtt gtgtaatctt ggacaagtta 60  
 cctaactttt ttgagtctga atatatttaa tctgcaaaat gagaatcatg ataatacgtc 120  
 ataggcttaa ttaggaggat taaatgaaat aatttatagg tggtgccatg gttacataca 180  
 agtattagta gttaattctt ttcctttggt tacttttata gtataggttg gatgaagggt 240  
 ccagtatagg caaaaatact acttgggggt aaagtagagt gtgatacttt atttgaaatg 300  
 ttccctgaat ctgatcttta ctttttgnta ctgctgcact acccaaatac aaattttcat 360  
 cccaacattc ttggatttgt gggacagcng tagcagcttt tccaatataa tctatactac 420  
 atcttttctt actttggtgc tttttg 446

<210> 94  
 <211> 409  
 <212> DNA  
 <213> Homo sapien

&lt;400&gt; 94

cgagcggccg	cccgggagc	tccatcagct	cttctgctta	gaatacgagg	cagacagtgg	60
agaggtcaca	tcagttatcg	tctatcaggg	tgatgaccca	agaaagggtga	gtgagaagggt	120
gtcggcacac	acgcctctgg	atccacccat	gcgagaagcc	ctcaagttgc	gtatccagga	180
ggagattgca	aagcgccaga	gccaacactg	accatgttga	aggcgtttctc	tccaggctgg	240
attcactgca	ctcgggaagaa	ttctgcccag	ggaatttagt	gtgggggtac	caggaccagt	300
ttgtcttgat	cttgagaccc	ccagagctgc	tgcattccata	gggtgttgca	ggactacacc	360
tggcctgcct	tcagtcatt	ctttcttata	tgttgaccca	tttgcccaa		409

&lt;210&gt; 95

&lt;211&gt; 490

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(490)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 95

tcgagcggcc	gcccgggag	gtcctacttg	tttgcagctt	ccacacactg	cacctaccta	60
ctacctctct	tccatgctta	actgggttta	gaaagggtgag	ctatgcgtag	aagaactact	120
tgggatattc	aagtgtctgta	tttgaacgat	aagcctatag	ataacagtct	gaagctgcaa	180
gggagacttt	gttagtacac	tactataaac	aggtaaaacta	cctgtttgta	cttgatatag	240
tgcataatgaa	atgactgatt	taatacaaaa	ctacagaaca	tgcaaaaattt	tttctgagat	300
gttaagtatt	acttcagtgg	agaacaaaac	ttacttaacc	tttcgctaata	gcatgtagta	360
ccagaaagca	aacatgggtt	tagcttcctt	tactcaaaat	atgaacatta	agtgggtgtg	420
aattttgtct	gccaaagtgt	tcagaaaata	cattataaat	aacctaagtt	aaaaaaaaaga	480
aactgngaac						490

&lt;210&gt; 96

&lt;211&gt; 223

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 96

agcgtgggtcg	cggccgaggt	ctggaagccc	accctaggac	ttgaatggca	ccttgtcctt	60
tctctgccag	taatgcaatc	caacacaata	tgctacaggg	aaaacagaat	ttccacgggtg	120
ccgccctctg	gtacaaggga	aacagcacgc	aaagcaaaag	gccacagagg	gctccctgag	180
aatccagtac	aactaagcga	ggacctgccc	gggcggccgc	tcg		223

&lt;210&gt; 97

&lt;211&gt; 527

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(527)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 97

tcgagcggcc	gcccgggag	gtctgtgcag	gagacactga	agtgggtagt	gtccataatc	60
tttttagcct	gttctgaaa	ttccagttgt	actccttcaa	accaaaatgc	ttacaggatc	120

atgggaaagc	ctcggttgca	gaaatcaaga	caggcaagt	ggaagataac	tcggctttga	180
ggttaaacag	atctgggttc	aaagcatagt	ttcactctct	gtcttgtgaa	gtgtcctggg	240
tgaagtcatt	tcctctcttg	aatttcagag	aggatgaaaa	tataaaaagt	ataataacta	300
tcttcataat	ctttgtgagg	attaaagaag	acgaagtgtg	tgaaaagcta	agcacagagc	360
aggcattcta	caataagtag	ttattatttt	tggaaaccatc	ccgnccctag	ccccagccca	420
attaccttct	cttagnctct	tcatatcgaa	ngccgtaatc	ttgaccttct	cttgcnactg	480
gattggtgct	ggttgatgcc	caaacttccc	gagatgctgt	ctgggaa		527

&lt;210&gt; 98

&lt;211&gt; 514

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(514)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 98

tcgagcggcc	gcccgggcag	gtctggctcc	catggccctt	ggggtggcct	gactctgtca	60
ctattcctaa	aaccttctag	gacatctgct	ccaggaagaa	ctttcaacac	caaaattcat	120
ctcaatttta	cagatgggaa	aagtgattct	gagaccagac	cagggtcagg	ccaaggtcat	180
ccagcatcag	tggctgggct	gagactgggc	ccagggaaac	ctgtctgctc	ctctttttcc	240
cagagctgtg	agttctctag	ccaaggctgc	actcttgagg	gagagccagg	aagcatagct	300
gaggccatga	caacctcact	cttcacctga	aaatttaacc	cgtggcagag	gatccaggca	360
catataggct	tcggagccaa	acaggacctc	ggccgcgacc	acgctaagcc	gaattccagc	420
acactggcgg	ccgttactag	tggatcccga	gcttnggtac	caagcttggc	gtaatcatgg	480
gcatagctgg	ttcctggggc	gaaaatggta	tccg			514

&lt;210&gt; 99

&lt;211&gt; 530

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(530)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 99

tcgagcggcc	gcccgggcag	gtctgaagaa	acagggtataa	atttggcagc	cagtaatttt	60
gacaggggaag	ttacagcttg	catgacttta	aatatgtaaa	tttgaaaata	ctgaatttcg	120
agtaatcatt	gtgctttgtg	ttgatctgaa	aaatataaca	ctggctgtcg	aagaagcatg	180
ttcaaaaata	tttaattcac	ttcaaaatgt	catacaaatt	atgggtggtt	ctatgcaccc	240
ctaaagcttc	aagtcattta	gtcaggtac	atactaaagt	aatatattaa	ttcttccagt	300
acagtgggtg	ttcataccat	tgacatttgc	ataccctaga	ataatttaag	aaagacatgt	360
gtaatattca	caatgttcag	aaaagcaagc	aaaagggtcaa	ggaacctgct	ttggttcttc	420
tggagatggn	ctcatatcag	cttcataaac	attcattcta	caaaatagta	agctaaccat	480
ttgaacccca	atttccagat	taagcatatt	ttctcataaa	tnatgaagcc		530

&lt;210&gt; 100

&lt;211&gt; 529

&lt;212&gt; DNA

&lt;213&gt; Homo sapien



&lt;400&gt; 100

agcgtggtcg	cggccgaggt	ccaggcacgg	tggcttatgt	gtgtaatccc	agcacttggg	60
gaggctgagg	gagggtggatc	acttgagtc	aggagtttga	gaccagtctg	ggcaacatgg	120
cgaacttca	tcactaccaa	agaagaaaaa	aattagccag	gtgtggtggt	gtatgcctgt	180
agtcccagat	actctggtgg	ctgagggtgag	aggatagctt	gagcccagga	aattgaggct	240
gcagtgaact	atgattgcac	tactgtgctc	cagcttgggc	aacagagtga	gatcttgtct	300
ccaaaagtcc	ttgaaggatt	ttaggaagtt	gttaaaagtc	ttgaaacgat	gtttgggggc	360
atgttaggg	tcttgaatgt	ttaattcttc	taataactgc	ttattcaaga	gaagcatttc	420
tgactgggtg	cggggcagtg	gcttcatgcc	ccataatccc	agtactttgg	gaggctgaag	480
caggaacatt	gcttgagccc	aggacttcaa	gaacagcctg	ggtaacata		529

&lt;210&gt; 101

&lt;211&gt; 277

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 101

tcgagcggcc	gcccgggcag	gtcgcaggaa	gaggatggaa	actgaggagt	ccaggaagaa	60
gagggaaacga	gatcttgagc	tggaaatggg	agatgattat	atcttggatc	ttcagaagta	120
ctgggattta	atgaatttgt	ctgaaaaaca	tgataagata	ccagaaatct	gggaaggcca	180
taatatagt	gattatattg	atccagccat	catgaagaaa	ttggaagaat	tagaaaaaga	240
agaagagctg	agaacagacc	tcggccgcga	ccacgct			277

&lt;210&gt; 102

&lt;211&gt; 490

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 102

gcgtgggtcgc	ggccgaggtc	tgacggcttt	gctgtcccag	agccgcctaa	acgcaagaaa	60
agtcgatggg	acagttagag	gggatgtgct	aaagcgtgaa	atcagttgtc	cttaattttt	120
agaaagattt	tggtaactag	gtgtctcagg	gctgggttgg	ggtccaaagt	gtaaggaccc	180
cctgccctta	gtggagagct	ggagcttggg	gacattaccc	cttcacaga	aggaattttc	240
ggatgttttc	ttgggaagct	gttttggtcc	ttggaagcag	tgagagctgg	gaagcttctt	300
ttggctctag	gtgagttgtc	atgtgggtaa	gttgaggtta	tcttgggata	aagggtcttc	360
tagggcacaa	aactcactct	aggtttatat	tgtatgtagc	ttatatattt	tactaagggtg	420
tcaccttata	agcatctata	aattgacttc	tttttcttag	ttgtatgacc	tgccccgggc	480
ggccgctcga						490

&lt;210&gt; 103

&lt;211&gt; 490

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 103

gagcggccgc	ccgggcaggt	ccaaaccagc	ttgctcataa	gtcattaacc	aaatccatta	60
taggtaattt	gttcagttca	atgtttacaa	ttcttatgga	aaaaattagc	aacacacaca	120
tttaaaacgt	gtgcattttac	ctttgcgtga	gtgcttaaaa	tacatatttc	tattttcaaga	180
tgacatttta	aaattattct	aatatatcag	cagcaaaaat	ataatttgca	attacaaaaa	240
actaaactag	aatccttaag	ttattctcat	gtttacagtt	gtgattcttt	aataaatact	300
attatgcagc	tctattgttt	aagctttctg	gatttggttt	aaacacatgc	atatatattg	360
tcaattgtgg	gaagctttac	aagttatatt	ccatgcactt	tttggacaga	gttctaacag	420
agccagccag	tccacaaaac	aggcaagaca	aaagttgaat	taactggggc	aaaataggac	480
tcttatgcaa						490

30

<210> 104  
 <211> 489  
 <212> DNA  
 <213> Homo sapien

<400> 104  
 cgtggtcgcg gccgaggtcc aggetgggtct cgaactcctg accttgatgat ctgcccgcct 60  
 cggcctccca aagtgttggg attacaggca tgagccactg cggccgaccg agttgaacat 120  
 ttaatgtcag actaggccag agttttctcaa tctttttatt ctcaattccc aaaggagccg 180  
 ttggagattt tccctcaat ctctctcctt catgaaattt cataccacaa atatagtagt 240  
 ttttatttat gtactgtgac cctttgaagg atcacaaacc aatataatag tttttctttt 300  
 taaccgcgtca aggaccaagt ttttgcccct gttggaaatg cataaactgg actgatgaat 360  
 tggtagatgat ggcttttatc atgaggatca gaaaaacttg aaattccttg gctacgacac 420  
 tccatattta tcaccgtata gggaggacct tggtagggg aagtagaaac acttctacac 480  
 ttacagca 489

<210> 105  
 <211> 479  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(479)  
 <223> n = A,T,C or G

<400> 105  
 gcgtgggtcgc ggccgaggtc tgactgggtt cagccccaga agttgagctg gccttttagac 60  
 aaaataattg cacttccctc tgctgcttat tcccttccgt ttttcatttg agtgaacat 120  
 gttagataaa atctgtgggt gnetcttcca ccttgctcta gtttccattg ctgtgagcag 180  
 gccctcctat gccccgcatt tagctacaat gctgtggact cacttgattc tttttctccg 240  
 agctttgtct agaaatatgt gaaggtgagg ttaagtgtt ctctgtgtag atccacttag 300  
 cctgtctgc tgtctcgatg ggcgttgctt cgtctctcct ctcttccatc ctttccattt 360  
 gcttctcacc accttctggc ttcttttctt aatgcaataa aggcagttt taacaaagaa 420  
 agaatgtggg ctttggagtt agacagacct ggntttaaat tctgcttctg gctctccaa 479

<210> 106  
 <211> 511  
 <212> DNA  
 <213> Homo sapien

<400> 106  
 tcgcgccga ggtccaaaac gtggattcca atgacctgcc ttgagccgc ggttgccagg 60  
 agttggacct gcagtagtat gggaagctca cggcctaaat accgactgcc ctctgacccc 120  
 accgtccagc gattctagaa ctttcttagt aggaagaca tagcaaggga ttttcatgat 180  
 tgggaaatac tgggagacaa gctgaagatt tgtaagggc tatgcttctg tcatctttta 240  
 ggtattttaag gctactcctt tagctagcta ctttagctg tttaaagtga ctatctcctt 300  
 acacagagtt acacaatgag catctctgaa agagaatatt accctggatt tccaaagatg 360  
 tactctaaca ggatgaccag gcaaaagggtg acccggggga ggagtctgtt ataactctg 420  
 gaccacatg ttctcaaggc acttcagaac tttgggaaat cttttgtac cggatcctca 480  
 gaaagcattt atggaaatac acatccttta g 511

<210> 107  
 <211> 451  
 <212> DNA

<213> Homo sapien

<400> 107

```

ggccgcccgg gcaggtccag aatatcaa at caaaagggtca caaatgttca cttcctcctc      60
caccctctta catattggat cttcaattgc aatagggagt gtaagatggg catttttagag      120
acgtagtgtgc atcagcagaa gcaaaccat cttatacaaa tgggttttgg ggataggaaa      180
aggctgctaa aaattcacia gtcaccattc cccagaagca atgaatagcc gtagaagacc      240
aagggaagatc aacaagtttc caaagtgtca aagccagaga tttggccctt ccaaaatacc      300
accaggacgc ctggaccctg gggctctccg catgtcacca ctgactgccg ggatgctgct      360
gcacctccct tccttgagac acaacagaga gacagtgaag tcacccaaga ctgggatcat      420
cagaggctcc tcctgcttgc tacagagaag c                                     451

```

<210> 108

<211> 461

<212> DNA

<213> Homo sapien

<400> 108

```

ccgcccgggc aggtcctgaa aacattcaga ctaatcaaaa tgggtactact gtaacttctt      60
ataatacata atataaaagt ttttgaaaga tatagacaca attaaccctt aaacaacaca      120
ctatctgatt ctcaaaagca atggctattt aacaagatgt aaaaggacaa taacatatca      180
aagaactttc acacacctaa agatagcatt tagcagcaag ttagtcagac aaaacaaaca      240
caaatatttt cacatttcct atgtttgttt ttaactttac ttcataaagc cactgataat      300
tgagggtttc ttcaagtata agatttctaa aattaaaaaac tgtttttgac atatttttat      360
aaagaaataa aaagcaaaac gcaatccaac tatttatatg agtccctctt ctccaacagc      420
tttagatggt tttctgagta cttttttaca cagaatattt t                                     461

```

<210> 109

<211> 441

<212> DNA

<213> Homo sapien

<400> 109

```

ggccgcccgg gcaggtctga ttataagaga aagaaatcca gtgacacgag ggcaggcagg      60
ccccgctctg ctctgatcga gaaaagcttc ctgatgtcag ggagatggaa ctgccaccat      120
cagaaccatg gcactttggg tgaagggtgtg tcagcgacca agggggcagg aaatgggcag      180
tgactaaggg ggcaggaaac aggcaggcac atggcaaggt tctcccagcc catcagccca      240
gtgatggcct cgattttgaa gctgcactac tgtctgaaaa gcacaattac tgggtgactct      300
taacaaactt cagcatactg ggaaggaga ctgtcaagta actgaattgg aaagatgaaa      360
aagaaccatc tctaaaagtt gatgcttgtc agaagaataa cctcctttgt gcaagtcttg      420
caacatcttc attcaaccac a                                     441

```

<210> 110

<211> 451

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1) ... (451)

<223> n = A,T,C or G

<400> 110

```

ggtcgcggcc gaggtctggg gaaggggtga gaatccctgg gccttgccca gtcctgagct      60
ctgggtgtct gcaggaagc acagtgggtg gttagtgtta aagaaagcat ccagagaggt      120

```

```

aagaggggct tgggtagcac cctttgcctc tgtcacttcc gcaaaaactt cttgttgagg 180
aggaagatga gaagggtgac attgactttg gccttggtga agagtttcat gacagccaca 240
ccctcatact ggagctgcan gagatcctga tagtgaagct tgaaatcgct ccatgtccac 300
acccaggaac ttggcattta cttcaaactt tcctgcctca tctcccggcg tgatgtcaaa 360
natgacgttt cttgaagtga gaggcgggaa agatcttcaa tttccaccaa agacaccctt 420
tttccaggaa gcttgagcaa caagtgtaat g 451

```

<210> 111

<211> 407

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1)...(407)

<223> n = A,T,C or G

<400> 111

```

ggccgacgtt cgacctgact tctttngagc agntgncact acccgtcttg aggaatgccg 60
actgcagaca gtggcccang gcaaagagtg tgcgtcatcg atganattgg naagatggag 120
ctcttcagtc agnttttcat tcaagctgnt cgtcagacgc tgtctacccc agggactata 180
atcctnggca caatcccagt tcctanagga aagccactgn ctcttgtaga agaaatcana 240
cacanaaagg atgtgaacng tgtttaatgt caccaaggga aaacatgaaa ccaccttctg 300
ccagatatcg ggacgttgcg tgcagatcaa gcacgnaagt gaagacgcgt gcattccttg 360
ccttcctgta acgantgcc agntcaagaa gancctgatg gaacct 407

```

<210> 112

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 112

```

tcgcggccga ggtcggccga ggtctgacat ctgttgctcg tgataaccac ttctgtattg 60
cgtcttaacc acttctgtat tgtgtggttt taactgccta aggcggcaat gggcagtggg 120
cccccttccc ttaggatggg tatcaattca acaatattta taaggcattt actgtgtgct 180
aagcatttgg aagacccagg ctacaaaata agacatagtt cctgccctcc aggcagcag 240
agggaggcac aaatacccag gaatctctga tgggtgtgaa gtgcggtcgt gggccacaga 300
aaatgaccgt catggagacc ctgctaaagg tcggaccctg agcccaaagg ggtattcaga 360
agnggagatg attttggccc cactcataga tgggtggcaa a 401

```

<210> 113

<211> 451

<212> DNA

<213> Homo sapien

<400> 113

```

gtcgcggccg aggtccatat taaaaagtcc atcataaaca aagactcctc ctcatggtat 60
gaatatgctc catatgcccc taatgggtgca taacggactt agaaattcca atgagtctta 120
gggttgaaat ttccaatgac ctgagcaagg cagctcccta tagcttctgg ataacatttt 180
acacccagag ttcaggctta aacagaccta tcaacacaat tattttcggg ttgtctgtct 240

```

33

```

agaaaacggc aatgctcaaa ggaatataaa taagggtggg gggacatatg cttccagcct 300
ggcctttctc catgtggtaa aaaacaatgg aatggctgtg ttaatttttt tttaatcttt 360
tctgaccttt actatgtttg gtaatggaaa taagtcaggg aaaacaaaat gaacaggtct 420
catcacttaa ttaatactgg gttttcttct t 451

```

```

<210> 114
<211> 441
<212> DNA
<213> Homo sapien

```

```

<400> 114
ggccgcccgg gcaggtccat cctgtcagag atgggagaag tcacagacgg aatgatggat 60
acaaagatgg ttcactttct tacacactat gctgacaaga ttgaatctgt tcatttttca 120
gaccagttct ctggtccaaa aattatgcaa gaggaagggtc agcctttaaa gctacctgac 180
actaagagga cactgttggt tacatttaat gtgcctgggt caggtaacac ttacccaaag 240
gatatggagg cactgctacc cctgatgaac atggtgattt attctattga taaagccaaa 300
aagttccgac tcaacagaga aggcaaacia aaagcagata agaaccgtgc ccgagtagaa 360
gagaacttct tgaaacttga cacatgtgca aagacaggaa gcagcacagt ctcgcgggga 420
ggaagaaaaa aagaacagag a 441

```

```

<210> 115
<211> 431
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(431)
<223> n = A,T,C or G

```

```

<400> 115
gccgcccggg caggtccatt ggccgtgaca aaaggaaaag aagcaaagag actcagttca 60
taatgctgat tagttagaag aaagggttag gattgagaaa gtaccaggaa cttttaatta 120
tttaaaagag aatgctgact gttaatgttt taaatcttac tgttcaaatg tactaatatg 180
aatttttacc ctttgtgcat gaatattcta aacaactaga agacctccac aatttagcag 240
ttatgaaagt taaacttttt attataaaaa ttctaaacct tactgtcctt ttaccaggaa 300
catgacacac tatttancat cagttgcata cctcgccaat agtataattc aactgtcttg 360
cccgaacaat catctccatc tggaagacgt aagcctttag aaacacattt ttctattaat 420
ttctctagaa c 431

```

```

<210> 116
<211> 421
<212> DNA
<213> Homo sapien

```

```

<400> 116
gtcgcggccg aggtccagaa atgaagaaga agtttgcaga tgtatttgca aagaagacga 60
aggcagagtg gtgtcaaate tttgacggca cagatgcctg tgtgactccg gttctgactt 120
ttgaggaggt tgttcatcat gatcacaaca aggaaccggg gctcgtttat caccagttag 180
gagcaggacg tgagcccccg cctgcacct ctgctgttaa acaccccagc catcccttct 240
ttcaaaaggg atcctttcat aggagaacac actgaggaga tacttgaaga atttgattc 300
agcccgcgaa gagattttatc aagcttaact cagataaaat cattgaaagt aataaggtaa 360
aagctaagtc tctaacttcc aggccacagg ctcaagtga tttcgaatac tgcatattaca 420
g 421

```

34

<210> 117  
 <211> 489  
 <212> DNA  
 <213> Homo sapien

<400> 117  
 agcgtggtcg cggccgaggt aaggctgcga ggttgtggtg tctgggaaac tccgaggaca 60  
 gagggctaaa tccatgaagt ttgtggatgg cctgatgac cacagcggag accctgttaa 120  
 ctactacgtt gacactgctg tgcgccacgt gttgctcaga cagggtgtgc tgggcatcaa 180  
 ggtgaagatc atgctgccct gggacccaac tggtaagatt ggccctaaga agcccctgcc 240  
 tgaccacgtg agcattgtgg aacccaaaga tgagatactg cccaccaccc ccatctcaga 300  
 acagaagggg ggggaagccag agccgcctgc catgccccag ccagtcccca cagcataaca 360  
 gggctcctct ggcagacctg cccgggcggc cgctcgaaag cccgaattcc agcacactgg 420  
 cggccgttac tagtggatcc cagctcggta ccaagcttgg cgtaatcatg gtcatagctg 480  
 gtttcctgt 489

<210> 118  
 <211> 489  
 <212> DNA  
 <213> Homo sapien

<400> 118  
 tcgagcggcc gcccgggcag gtattgaata cagcaaaatt ctatatacaa agtgacctgg 60  
 acctgctgct tcaaaacatg atcctttctt actaatatct tgatagtcgg tccatagagc 120  
 attagaaagc aattgactct taaataaaca gaaaagtgcc taatgcacat taaatgaatg 180  
 gcctaactac tggaacttta gtagttctat aagggtgatta acataggtag gatccagttc 240  
 ctatgacagg ctgctgaaga acagatatga gcatcaagag gccattttgt gcactgccac 300  
 cgtgatgcca tcgtgtttct ggatcataat gttcccatta tctgattcta gacacaccac 360  
 aggaatatca gtggggtcag aggttagctt agctgcttgc tgggctagaa cagatatcac 420  
 tccagcatgc tcatctgaca gggccccgcg gcaaccaga ttaagtcctt gtgaatctgt 480  
 gcacagga 489

<210> 119  
 <211> 181  
 <212> DNA  
 <213> Homo sapien

<400> 119  
 taggttccag agacttttgg cccaggagga atatttactt ttagctctgg acatcattac 60  
 aaaaaggaat atttcccaa cctcttcaga ccgagaatac atgggtaaaa ttattaaata 120  
 gttgtataat aaaaataatt ttttccttaa aaaaaaaaaa aacctcggcc gcgaccacgc 180  
 t 181

<210> 120  
 <211> 489  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(489)  
 <223> n = A,T,C or G

<400> 120  
 gcgtggtcgc ggccgaggtc catttaaaac aaagaaaaat actaaagcca ctagtaaaaca 60

tctgatgtgc	aaaatacaac	atcctctagt	tggctttatg	ccattattac	ataagctcca	120
aatagctcat	cttaaatata	aaagaaaaag	tggctgtccc	atctctgctg	cataaatcag	180
atTTTTTTTT	aaaggtttag	agtactttta	ggaaggggaag	ttcaaaaactg	ccagtgaat	240
tcacagagaa	tacaaattta	gcaattttaat	ttcccaaagc	tctttgaaga	agcaagagag	300
tctctcttct	taatgcagt	ttctcccaag	aggaactgta	atTTTgcttg	gtacttatgc	360
tgggagatat	gcaaaatgtg	TTTTTcaatg	tttgctagaa	tataatgggt	cctcttcagt	420
gnctggttca	tcctggaact	catgggttaa	gaaggacttc	ttggagccga	actgcccggg	480
cgggccttt						489

<210> 121  
 <211> 531  
 <212> DNA  
 <213> Homo sapien

<400> 121						
cgagcggccg	cccgggcagg	tggccagcgc	tggctccgca	gacgccgaga	tggaggaaat	60
atttgatgat	gcgtcacctg	gaaagcaaaa	ggaaatccaa	gaaccagatc	ctacctatga	120
agaaaaaatg	caaactgacc	gggcaaatag	attcgagtat	ttattaaagc	agacagaact	180
TTTTgcacat	ttcattcaac	ctgctgctca	gaagactcca	acttcacctt	tgaagatgaa	240
accagggcgc	ccacgaataa	aaaaagatga	gaagcagaac	ttactatccg	ttggcgatta	300
ccgacaccgt	agaacagagc	aagaggagga	tgaagagcta	ttaacagaaa	gtcccaaagc	360
aaccaatgtt	tgcactcgat	ttgaagactc	tccatcgtat	gtaaaatggg	gtaaactgag	420
agattatcag	gtcccagagga	ttaaactggc	tcattttctt	gtatgagaat	ggcatcaatg	480
gtatccttgc	agatgaaatg	ggcctaggaa	agactcttca	acaattttct	t	531

<210> 122  
 <211> 174  
 <212> DNA  
 <213> Homo sapien

<400> 122						
tcgagcggcc	gcccgggcag	gtctgccaac	agcagaggcg	gggcctccgg	catcttcaaa	60
gcacctctga	gcaggctcca	gccctctggc	tgcggggagg	gtctgggggtc	tcctctgagc	120
tcggcagcaa	agcagatgtt	atTTTctctc	cgcgacctcg	gccgcgacca	cgct	174

<210> 123  
 <211> 531  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(531)  
 <223> n = A,T,C or G

<400> 123						
agcgtggctg	cggccgaggt	cctcaaccaa	gagggttgat	ggcctccagt	caagaaactg	60
tggctcatgc	cagcagagct	ctctcctcgt	ccagcaggcg	ccatgcaagg	gcaggctaaa	120
agacctccag	tgcattcaaca	tccatctagc	anagagaaaa	ggggcactga	agcagctatg	180
tctgccaggg	gctagggggt	cccttgccaga	cagcaatgct	acaataaagg	acacagaaat	240
gggggagggtg	gggggaagccc	tattttttata	acaaagtcaa	acagatctgt	gccgttcatt	300
ccccagaca	cacaagtaga	aaaaaaccaa	tgcttggtgt	ttctgccaag	atggaatatt	360
cctccttctt	aanttccaca	catggccgtt	tgcaatgctc	gacagcattg	cactgggctg	420
cttgtctctg	tgggtctgggc	accagtagct	tgggccccat	atacacttct	cagttcccac	480
anggcttatg	gccnangggc	angctccaat	tttcaagcac	cacgaaggaa	g	531

<210> 124  
 <211> 416  
 <212> DNA  
 <213> Homo sapien

<400> 124  
 tcgagcggcc gcccgggcag gtccatctat actttctaga gcagtaaadc tcataaattc 60  
 acttaccaag cccaggaata atgactttta aagccttgaa tatcaactaa gacaaattat 120  
 gccaatcttg atttctcaca tatacttaga ttacacaaag ataaagcttt agatgtgatc 180  
 attgtttaat gtagacttat ctttaaagtt tttaattaaa aactacagaa gggagtaaac 240  
 agcaagccaa atgattttaac caaatgattt aagagtaaaa ctactcaga aagcattata 300  
 cgtaactaaa tatacatgag catgattata tacatacatg aaactgcaat tttatggcat 360  
 tctaagtaac tcatttaagt acatttttgg catttaaaaca aagatcaaat caagct 416

<210> 125  
 <211> 199  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(199)  
 <223> n = A,T,C or G

<400> 125  
 agcgtggtcg cggccgaggt gctttttttt tttttttttt tttttttttt gctattctaa 60  
 aggggaaggc ccttttttat taaacttgta cattttactt tccttctttc anaatgctaa 120  
 taaaaaactt ttgtttatag ttaaaaaaac cataaatcan acaaacaaaa gaaacgattc 180  
 caacatcact tctgngatg 199

<210> 126  
 <211> 490  
 <212> DNA  
 <213> Homo sapien

<400> 126  
 cgtggtcgcg gccgaggtcc agttgctcta agtggattgg atatggttgg agtggcacag 60  
 actggatctg ggaaaacatt gtcttatttg cttcctgcca ttgtccacat caatcatcag 120  
 ccattcctag agagaggcga tgggcctatt tgtttggtgc tggcaccaac tcgggaactg 180  
 gccaacagg tgagcaagt agctgctgaa tattgtagag catgtcgctt gaagtctact 240  
 tgtatctacg gtggtgctcc taagggaacca caaatacgtg atttggagag aggtgtggaa 300  
 atctgtattg caacacctgg aagactgatt gacttttttag agtgtggaaa aaccaatctg 360  
 agaagaacaa cctaccttgt ccttgatgaa gcagatagaa tgcttgatat gggctttgaa 420  
 ccccaataa ggaagattgt ggatcaaata agacctgata ggcaaactct aatgtggagt 480  
 gcgacttggc 490

<210> 127  
 <211> 490  
 <212> DNA  
 <213> Homo sapien

<400> 127  
 cgtggtcgcg gccgaggtcg gccgaggtct ggagatctga gaacgggcag actgcctcct 60  
 caagtgggtc cctgacctct gacccccgag cagcctaact gggaggcacc cccagcagg 120



```

ggcacactga cacctcacac ggcaggggat tccaacagac ctgaagctga gggtcctgtc 180
tgtagaagg aaaactaaca agcagaaagg acagccacat caaaaaccca tctgtacatc 240
accatcatca aagacaaaa gtataaaaa ccacaaagat gggaaaaaaa cagaacagaa 300
aaactggaaa ctctaaaaag cagagcacct ctctcttcc aaaggaacgc agttcctcac 360
cagcaatgga acaaagctgg atggagaatg accttgacga gctgagaaaa gaacgcttca 420
gacgatcaaa ttactctgag ctacgggagg acattcaaac caaaggcaaa gaagttgaaa 480
actttgaaaa

```

&lt;210&gt; 128

&lt;211&gt; 469

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(469)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 128

```

cgtgggtcgc gccgaggtgc tttttttttt tttttttttt tttttttttt tgctgattta 60
ttttttctnt ttattgttac atacaatgta taaacacata aaacanaaaa cagtagggat 120
cctctaggat ctctagggan acagtaaagt anaaagaggt ctcanaaaaca ttttttttaa 180
gtacaagaca ttcagngctc ggcccaaagg cgtaaaaggt ttanagccag canatagctg 240
nactaaaggc tccgtctntn tccccanagc caggacaacc ccaggagct ntccattagc 300
agccagtcca cgcaggcagg atgctgcgga aaaagctcta tgctganaac attccccctg 360
atggaaaagaa gggcaacaca aaaggggtaa ctaanagctc ctccctctcg tgagggcgac 420
aactgaggaa cagaaaagga gtgtcccatg tcacttttga cccctccc 469

```

&lt;210&gt; 129

&lt;211&gt; 419

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 129

```

gcgtgggtcgc ggccgaggtc tgattttcat ttaaataatt cagagctata gcatttgcct 60
ccatgctcaa atccacacca ttggggctta agccgctcat gccaacatta gcaaatgaca 120
tgcagtttaa tccagagatc actgcttctg ggctgatgca tgccaacaca ctggcgtgat 180
ccacgttatg tgcatttttc ttacttttag tgggagaatc aatttttact ccaaggcttc 240
ttagttgctt aagagttgca ttaaggacac aatctttgtc caccagtctt gaatgatgtg 300
tttttttctt tgtatggtaa acgttttggg ttctgggtgca ttcatgactg ataattactg 360
ctttggtaga cggctgctca agtttccttg gaggaactat ttaatagggtg gggtacttg 419

```

&lt;210&gt; 130

&lt;211&gt; 354

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 130

```

agcgtgggtcg cggccgaggt ccatctgagg agataaccac atcactaaca aagtgggagt 60
gaccccgagc agcacgctgt ggaattccat agttggctc atccctgggc agttccaca 120
tgatgatggt cttatctcga gaggcggaga ggaatcgtc cggaactgc ggggtagtag 180
cgatctgggt taccagccg ttgtggccct tgagggtgcc acgaagggtc atctgctcag 240
tcatggcggc ggcgagagcg tgtgtcgctg cagcgacgag gatggcactg gatggcttag 300
agaaactagc accacaacct ctctgccgc acctgccgc gggcccgct cgaa 354

```

<210> 131  
 <211> 474  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(474)  
 <223> n = A,T,C or G

<400> 131  
 cgagcggccg cccgggcagg tctggcagca gcttcctctg gaataattga cagctttgtg 60  
 ctgcctgact aaaatttgaa atgacaaccg ctgaatgtaa aatgatgtac ctacaatgag 120  
 agagatttag gaatactatc tgtcaatcca tagatgtaga aacaaaacaa actacagaat 180  
 gaaaacaaac ttatttttaa ccaaagaaac aaatgtatcc aaaatatagt ccatgatata 240  
 tttgattact agtataacca cagttgaaaa cttaaaaaaa aaaattgaca ttttttgtaa 300  
 tgggtactaa tggatttata aaaggtttct gtttccaaag atgttattgg ggtccacata 360  
 ttccttgaag acttcagcat cccaaagccc gacatcagag atactttcct ttagccattg 420  
 nttcccgtaa cttgccact ccatggtgat gtgacaggct tcccttcatt agca 474

<210> 132  
 <211> 474  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(474)  
 <223> n = A,T,C or G

<400> 132  
 ggccgaggtg ggggaattcat gtggaggtca gagtggaagc aggtgtgaga gggccagca 60  
 gaaggaaaca tggctgccaa agtgtttgag tccattggca agtttggcct ggccttagct 120  
 gttgcaggag gcgtggtgaa ctctgcctta tataatgtgg atgctgggca cagagctgtc 180  
 atctttgacc gattccgtgg agtgcaggac attgtggtag ggggaaggac tcattttctc 240  
 atcccgtggg tacagaaacc aattatcttt gactgccgtt ctgcaccacg taatgtgcca 300  
 gtcacactg gtagcaaaga tttacagaat gtcaacatca cactgcgcat cctcttccgg 360  
 cctgtcgcca gccagcttcc tcgcatcttc accagcatcg ganaggacta tgatgaaccg 420  
 tgtgtgcccg tccatcacia ctgagatcct caagtcagtg gtggctcgct ttga 474

<210> 133  
 <211> 387  
 <212> DNA  
 <213> Homo sapien

<400> 133  
 tgctcgagcg gccgccagtg tgatggatat ctgcagaatt cggcttagcg tggctcgggc 60  
 cgaggtctgc gggcccctta gcctgccctg cttccaagcg acggccatcc cagtagggga 120  
 ctttccaca ctgtgccttt acgatcagcg tgacagagta gaagctggag tgcctcacca 180  
 cacggcccgg aaacagcggg aagtaactgg aaagagcttt aggacagctt agatgccgag 240  
 tgggcgaatg ccagaccaat gataccaga gctacctgcc gccaaactgt tgagatgtgt 300  
 gtttgactgt gagagagtgt gtgtttgtgt gtgtgttttg ccatgaactg tggccccagt 360  
 gtatagtgtt tcagtggggg agaactg 387

<210> 134

<211> 401  
 <212> DNA  
 <213> Homo sapien

<400> 134  
 ggccgccccg gcaggctctga tgaagaacac ggggtgtgatc cttgccaatg acgccaatgc 60  
 tgagcggctc aagagtgttg tgggcaactt gcacggctg ggagtcacca acaccattat 120  
 cagccactat gatggcgcc agttcccaa ggtgggtggg ggctttgacc gagtactgct 180  
 ggatgctccc tgcagtggca ctggggtcat ctccaaggat ccagccgtga agactaacia 240  
 ggatgagaag gacatcctgc gcttgtgctc acctccagaa ggaagttgct cctgagtgtc 300  
 attgactctt gtcaatgcga ccttcaagac aggaggctac ctggtttact gcacctgttc 360  
 tatcacagtg agacctctgc catggcagaa caggggaagc t 401

<210> 135  
 <211> 451  
 <212> DNA  
 <213> Homo sapien

<400> 135  
 ggtcgcgcc gaggtctgtt cctgagaaca gcctgcattg gaatctacag agaggacaac 60  
 taatgtgagt gaggaagtga ctgtatgttg actgtggaga aagtaagtca cgtgggccct 120  
 tgaggacctg gactgggtta ggaacagttg tactttcaga ggtgaggtgt cgagaaggga 180  
 aagtgaatgt ggtctggagt gtgtccttgg ccttggctcc acaggggtgt ctttcctctg 240  
 gggccgtcag ggagctcatc ccttgtgttc tgccagggtg gggtagcggg gtttgacact 300  
 gaggagggtg acctgctggc tggagcggca gaacagtggc cttgatttgt cttttggaag 360  
 attttaaaaa ccaaaaagca taaacattct ggtccttcac aatgctttct ctgaagaaat 420  
 acttaacgga aggacttctc cattcaccat t 451

<210> 136  
 <211> 411  
 <212> DNA  
 <213> Homo sapien

<400> 136  
 ggccgccccg gcaggctctga atcacgtaga atttgaagat caagatgatg aagccagagt 60  
 tcagtatgag ggttttcgac ctgggatgta tgtccgcgtt gagattgaaa atgttccttg 120  
 tgaatttgtg cagaactttg acccccttta cccattatc ctgggtggct tgggcaacag 180  
 tgagggaat gttggacatg tgcagggtgg tccctttgct gcgtatttgg tgcctgaggc 240  
 tctgtggatt tcccctccat caatcatctt accctctcat cccctcaga tgcgtctgaa 300  
 gaaacatctc tgggtataaga aaatcctcaa gtcccaagat ccaatcatat tttctgtagg 360  
 gtggaggaag ttccagacca tcctgtctta ttatatccga agaccacaat g 411

<210> 137  
 <211> 211  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(211)  
 <223> n = A,T,C or G

<400> 137  
 cgccgccccg ggcaggctcg ttgggtcgcc ctccattgtt cgtgttttaa ggcgccatga 60  
 ggggtgacag aggccgtggc cgtgggtggc gctttggttc cagaggaggc ccaggaggag 120

ggttcaggcc ctttgcacca catatcccat ttgacttcta tttgtgtgaa atggcctttc 180  
 cccggntcaa gccagcacct cgatgaaact t 211

<210> 138  
 <211> 471  
 <212> DNA  
 <213> Homo sapien

<400> 138  
 gccgcccggg caggtctggg ctggcgactg gcatccaggc cgtaactgca aatctatgct 60  
 agggcggggtc tcccttctgt gtgttcaagt gttctcgact tggattctta actattttta 120  
 aaaatgcact gagtttgggt taaaaaccaa ccacaaaat ggatttcaac acagctctaa 180  
 agccaagggc gtggccggct ctcccaacac agcgactcct ggaggccagg tgcccatggg 240  
 cctacatccc ctctcagcac tgaacagtga gttgattttt ctttttaca taaaaaaagc 300  
 tgagtaatat tgcataaggag taccaagaaa ctgcctcatt ggaaacaaaa actatttaca 360  
 ttaaataaaa agcctggccg caggctgcgt ctgccacatt tacagcacgg tgcgatgcac 420  
 acggtgacca aaccacggag gcaagcttct ggcactcaca ccacgacccg c 471

<210> 139  
 <211> 481  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(481)  
 <223> n = A,T,C or G

<400> 139  
 gtcgcgcccg aggtctgttc tttagctcag atttaaacct gctgtctctt ctttatttgc 60  
 agaatgaatt cccagttcct gagcagttca agaccctatg gaacgggcag aagttgggtca 120  
 ccacagtgc agaaattgct ggataagcga agtgccactg ggttctttgc cctcccttca 180  
 caccatggga taaatctgta tcaagacggt tcttttctag atttctctta cttttttgct 240  
 cttaaaactg cttctctgct ctgagaagca cagctacctg ctttctactga aatataacctc 300  
 aggctgaaat ttgggggtggg atagcaggtc agttgatctt ctgcaggaag gtgcagcttt 360  
 tccatatcag ctcaaccacg ccgncagtc attcttaagg aactgccgac taggactgat 420  
 gatgcatttt agctttttgag cttttggggg gtattctacc aaccaacagt ccattttggaa 480  
 a 481

<210> 140  
 <211> 421  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(421)  
 <223> n = A,T,C or G

<400> 140  
 gtcgcgcccg aggtttccca ttttaagaaa atagatcttg agattctgat tcttttccaa 60  
 acagtcccct gctttcatgt acagcttttt ctttacctta cccaaaattc tggccttgaa 120  
 gcagtttttc tctatggctt tgctttctctg attttctcag aggctcgagt ctttaataata 180  
 accccaaatg aaagaaccaa ggggaggggt gggatggcac ttttttttgt tggctctgtt 240  
 ttgttttgtt ttttgggttg ttgggttcctg ttatttttta agattagcca ttctctgctg 300

41

ctatttcctt acataatgtc aatttttaac cataattttg acatgattga gatgtacttg 360  
 aggctttttt gntttaattg agaaaagact ttgcaatttt ttttttagga tgagcctctc 420  
 c 421

<210> 141  
 <211> 242  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(242)  
 <223> n = A,T,C or G

<400> 141  
 cgantngccc gcccgggcan gtctgtctaa nttntcang gaccacgaac agaaactcgt 60  
 gcttcaccga anaacaatat cttaaacatc gaanaattta aatattatga aaaaaaacat 120  
 tgcaaaatat aaaataaata nnaaaaggaa aggaaacttt gaaccttatg taccgagcaa 180  
 atccaggctt agcaaacagt gctagtctta nattacttga tntacaacaa cacatgaata 240  
 ca 242

<210> 142  
 <211> 551  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(551)  
 <223> n = A,T,C or G

<400> 142  
 agcgtgggtcg cggcncgang tccacagggc anatattctt ttagtgtctg gaattaaaat 60  
 gtttgagggt tangtttgcc attgtctttc caaaaggcca aataattcan atgtaaccac 120  
 accaagtgc aacctgtgct ttctatttca cgtactgttg tccatacagt tctaaataca 180  
 tgtgcagggg attgtagcta atgcattaca cagtcgttca gtcttctctg cagacacact 240  
 aagtgatcat accaacgtgt tataactca actagaanat aataagcttt aatctgaggg 300  
 caagtacagt cctgacaaaa gggcaagttt gcataataga tcttcgatca attctctctc 360  
 caagggggccc gcaactaggc tattattcat aaacacaaac tgaanagggg attggtttta 420  
 ctggtaaatc atgtgntgct aatcattttt ctgaacagtg ggggtctaat cantcattga 480  
 tttagtggca gccacctgcc cggcggccgn tcgaagccca attctgcaga tatccatcac 540  
 actggcggcc g 551

<210> 143  
 <211> 515  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(515)  
 <223> n = A,T,C or G

<400> 143  
 cgagngggccc gcccgggcag gtatcttcac aaactcaaca aaggcactac atgagacttc 60

42

```

acattcccct agtccaatag ctgacaaatt tttgcaacgt tctgcaatgc gaattaactc 120
ttcatcaagt ggccgtaatc catttgacac cactactagt tcaaccagtc tagggcatgt 180
cattcccaca cggccaagca catctttgct tactgatctc ccaaagtaca gatgggtggc 240
aggtatttca tagcgaaaga aggggtcaaa ttctttctca tataanaaaa aatacatcac 300
taagttcact ttgggtgaat gtctgatgaa agcatccag ctactcttct gaatagtatg 360
gaagtgtgtc tgtccaggat tctcactgac tacatcaatg cgcaaagtgt ctaatcgaac 420
atgtttttca gaagacaatg caagtaacaa ctcactactc aataagtggg aagttcaggg 480
ctagttctct taagccgnga cactgatcag cacac 515

```

&lt;210&gt; 144

&lt;211&gt; 247

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1) ... (247)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 144

```

tgcattctct ntggatgcan acctgcccgt tggtagggac tntgctcaca cggaacatgg 60
acggttacac ctgtgccgtg ggtgacgtcc accagcttct ggatcatctc ggcnggggtg 120
ttgtggaagg gcagactatc cacctccatg cncacgatgc ccganacgcc actccggact 180
ntgtgctgca ccaanatgcc cagcattnta tcttcaagca nagcacttat cagggtcctt 240
ggcacac 247

```

&lt;210&gt; 145

&lt;211&gt; 309

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1) ... (309)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 145

```

cgtgggtcgc ggcccgangt ctgctgtaac aaaacacccat agtctgggca gctcatagac 60
aatggaattt tatttctcac gcttctggag gctggattcc aagatcaagg ttccaggaga 120
ctcagtgtct ggcaagggtc cggtttctgc ctcanagatg gtgccatctg gctgtgtcct 180
cacaagtagg aaggtgcaag aagctcccct caggctctgt ctgtaagaca ctgatcccat 240
tcatganggg gaaacgtaat gacctaatca gccccagag accccacttc taacaccatc 300
accttgggg 309

```

&lt;210&gt; 146

&lt;211&gt; 486

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1) ... (486)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 146

```

agcgtgggtc gcggcncgac gtcctgtcca tatttcacag cccgagaact aatacaagat    60
gctgacatca tattttgtcc ctacaactat cttctanatg cacaataaag ggaaagtatg    120
gatttaaadc tgaaagaaca ggttgtcatt ttanatgaag ctcataacat cgaggactgt    180
gctcgggaat cagcaagtta cagtgtaca gaagttcagc ttcggtttgc tcgggatgaa    240
ctanatagta tgggtcaaca taatataagg aaganagatc atgaacccct acgagctgtg    300
tgctgtagcc tcattaattg gntagaagca aacgctgaat atcttgnana angagantat    360
gaatcagctt gtaaaatatg gagtggaaat gaaatgctct taactttaca caaaatgggt    420
atcaccactg ctacttttcc cattttgcng gtaagatatn ttttctacct gngaaacgta    480
ttaag                                         486

```

&lt;210&gt; 147

&lt;211&gt; 430

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(430)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 147

```

gccgcccggg cangttcgac attacntnga gttccatgat gtacaattct ttcacgaaaa    60
acaatgaatg caagaatttg aggatctcct tactcctccc ttttacagat ggtctctcaa    120
tcccttcttc ttctcttcca tcttcatctt cttctgaacg cgctgccggg taccacggct    180
ttctttgtct ttatcgtgag atgaagggtga tgcttctgtt tcttctacca taactgaaga    240
aatttcgctg caagtctctt gactggctgt ttctccgact tcgcctttnt gtcaaacgng    300
agtcttttta cctcatgccc ctacgttcca cagcatcttc atctggatgt tnatttctca    360
aagggctcac tgaggaaact tctgattcan atgtcgaana gcactgtgaa gttttctctt    420
cattttgctg                                         480

```

&lt;210&gt; 148

&lt;211&gt; 483

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(483)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 148

```

cccgggcagg tctgtgttgn tttncacccg gtgtcctccc cagcgtccag aananggaaa    60
tgtggagcgg gtgatgatga cccctcgctg tcctgtcacc tcctgcacag cttcgtatgt    120
gggtctggtc tgggaccacc cgtacaggtt gtgcacgttg tagtgctcca cgggggagct    180
gtccggcagg atctgctgac tctccatgca cagagtcttg ctgctcaggc ctttgtccct    240
agattccaaa tatggcatat aggggtgggt tatttagcat ttcattgctg cagcccctga    300
cagatccatc cacaaaattt gatggctcat tcatatcaat ccacaatcca tcaaacttca    360
agctcttctc tggntctcga nggtttgcat agaactcttc tatctcttcc ttcaccacg    420
canacctcgg ncgcgaccac gctaagccga attctgcana tatccatcac actggcgggc    480
gct                                         483

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&lt;210&gt; 149

&lt;211&gt; 439

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(439)  
 <223> n = A,T,C or G

<400> 149

ctttcacgaa nacaatgaat gcaagaattt gaggatctcc ttactcctcc cttttacaga	60
tggctctctca atcccttctt cttcctcttc atcttcatct tcttctgaac gcgctgccgg	120
gtaccacggc tttctttgtc tttatcgtga gatgaagggt atgcttctgt ttcttctacc	180
ataactgaag aaatttcgct gcaagtctct tgactgggtg tttctccgac ttcgcctttt	240
tgcaaacgtg agtcttttta cctcatgccc ctccagcttc acagcatctt catctggatg	300
ttcatttctc aaagggtcga ctgaggaaac ttctgactca catgtcgaag aagcactgng	360
agtttctctt catttgctgc aaanttgctc tttgctgggt gngctctcag accacccatt	420
tggctgcatg ggggctgac	439

<210> 150  
 <211> 578  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(578)  
 <223> n = A,T,C or G

<400> 150

ggcncgcccc ggcangtcca ctccactttt gagctctgag ggaatacctt caggagggac	60
agggtcaggg agtcctggca gctccgcagc agagattcac attcattcag agacttggtg	120
tccagtgaac tgccattgat cgcaacgata ctgtctccca cagcaagggg cccttcttta	180
gcggcagggc ttccaggcag cacagcggca gcatacactc cattctccag actgatgcca	240
ctgtctttct gtccactgan gttgatgtgc agcggcgtga ccaccttccc acccagggac	300
ttcctccgcc gcacgaccat gttgatgggc cccctnccca ttgaggagcg ccttgatggc	360
ctgcttcttg nccttggtga tgaagtcacac atcgggtgatt ctccagacca gtcattgacc	420
cttaagcggg catcagcaat gcttctcttg gccactttag ngacaaatat gccacagtcc	480
ccgggaaaca agggtcattc acaccttctg gcatacaaaa cacctcggcc gggancacta	540
agccgaattc tgcagatata catcacactg gngggccg	578

<210> 151  
 <211> 503  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(503)  
 <223> n = A,T,C or G

<400> 151

cgagcggccc gcccgggcag gtctgggaga tcagcgactg ctgccacgtg cccagaaatg	60
gctcgtcctt tcactacagc ggaatgcaat gaggggtgggt gagaagatga tgggtcggtt	120
atttcattcc ttttcttttt acaacttcac ttccagagac ttccagcgttc catgtctgct	180
gtgctgtgga acccagagtg ctcttgcttg gatggctgag aatcccttgg accctggaag	240
cacctactcc atgatggccc ggtatagtgc aggtcacaata taatcttccc ggtatcttga	300
gttgataact cgttgccgtt tcttttcttg cttaacctct ttctctgtga aaatctcatt	360



45

gaagcgcacg tctgaagcta ctgacagtct anatttgact ctcttgggaa gctcttcacg 420  
cagtgtgtat acatcatctc tcttaaccac aagttggagc catncttaaa cttcacctgg 480  
tacatttgga taggggtggga ggc 503

<210> 152  
<211> 553  
<212> DNA  
<213> Homo sapien

<220>  
<221> misc\_feature  
<222> (1)...(553)  
<223> n = A,T,C or G

<400> 152  
agcgtggtcg cggcccgagg tccactgagc tccgccttcc cggggctccc tgaggaagca 60  
gagtcctgac ttccaggaag gacaggacac agaggcaaga actcagcctg tgaggctctg 120  
gggtggctcct gaggccagag gacgccttcc gcgatccatg gctcagcatc gtccttctgg 180  
cttcccagcc cggggccgaa cggtcgggtt aataagcaga gcagttattc ggctcctggc 240  
aggagctccc cggtagttt ccacgttggt agcacattca tacttaagac tgncttctctt 300  
tgtgttttaa gcgtctgtct ctgtagtaaa ctgaaatgtt aacagaaatg cagacctgcc 360  
cgggcggccg ctcgaaagcc gaattctgca gatatccatc acactggcgg ccgctcgagc 420  
atgcacttag anggcccaat tcgccctata gtgagtcgna ttacaattca ctgggcccgcg 480  
ntttacaacg tcgtgactgg gaaaaccctg cgggtaccac ttaatcgctt tgcagnacat 540  
ccccctttcg cca 553

<210> 153  
<211> 454  
<212> DNA  
<213> Homo sapien

<220>  
<221> misc\_feature  
<222> (1)...(454)  
<223> n = A,T,C or G

<400> 153  
tcgagcggct cgcccgggca ggtccaccta gcatggctcc tctaaacacg caactcagcg 60  
aggggacccc cttcacctct ggcaagagag ctgggtagat cagaaacttg gtgacacctg 120  
gctagcacag agcaggctca cttgtcttgg tcccactacc cagattcctg cagacattgc 180  
aaaccaaagt aaggttgntg aatgaccctt gtccccagcc acttggtttg gtatcatctg 240  
ctctgcagtg gaatgcctgt gtgtttgagt tcaactctgca tctgtatatt tgagtataga 300  
aaccgantca agtgcctgt gcattcagac acactggggc acctgancac agaacaatc 360  
accttaacga tctggaatga aactgnganc antgcccgcg tgggtgggtc tgganaaact 420  
gccgncttct tgttggaact tggccgcacc acct 454

<210> 154  
<211> 596  
<212> DNA  
<213> Homo sapien

<220>  
<221> misc\_feature  
<222> (1)...(596)  
<223> n = A,T,C or G

<400> 154  
 agcgtgggtcg cggcccgang gcggcctcct gantganggg aagggacgtg ggggcggcca 60  
 cggcaggatt aacctccatt tcagctaatac atgggagaga ttaaagtctc tcctgattat 120  
 aactggttta naggtacagt tccccctaaa aagattattg tggatgatga tgacagtaag 180  
 atatggtcgc tctatgacgc gggcccccca agtatcaggt gtcctctcat attcctgccc 240  
 cctgtcagtg gaactgcaga tgtctttttc cggcagattt tggctctgac tggatggggt 300  
 taccgggtta tcgctttgca gtatccagtt tattgggacc atctcgagtt cttgtgatgg 360  
 attcacaaaa cttttanacc atttacaatt ggataaagtt catctttttg gcgcttcttt 420  
 gggangcttt ttggcccana aatttgctga atacactcac aaatctccta gaagccattc 480  
 cctaattctc tgcaattcct tcagngacac ctctatcttc aaccaacttg gactggaaac 540  
 agctttggct gatgcctgca tttatgctca aaaaatagtt cttggaaatt ttcacc 596

<210> 155  
 <211> 343  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(343)  
 <223> n = A,T,C or G

<400> 155  
 ctcganttgg cncgcccggg cangtctgcc tggtttttga ccgngcgagc tatttagtct 60  
 ctggctctgt ttccggagct caaggnaaaa atcttgaana actcgagcag cttctgtgga 120  
 tagccttggg tacacatact gccgagcata gccaatgtac tttctcaata gctgggtggg 180  
 aatgggatct attgtttctc caggaaccac ctttagtctt tctgataatg gcttctcaga 240  
 aactacttca agtacggaag tatttgaatc ttgactatnc atacgagcta ctgtggcact 300  
 gctaattgggn tctctgctnt ccagctctta ttgcaatcac atg 343

<210> 156  
 <211> 556  
 <212> DNA  
 <213> Homo sapien

<220>  
 <221> misc\_feature  
 <222> (1)...(556)  
 <223> n = A,T,C or G

<400> 156  
 tcgagcggcc cgcccgggca ggtctggcac cacncagatc gattaactgg ctcatctgat 60  
 ctggtggccc ccaccctgga actgacttag cacaaaagga cacctcaatt ccttatgatt 120  
 tcatctccga cccaaccaat caacaccctt gactcactgg ccttccccct cccaccaaat 180  
 tacccttaaa aactctgata cccgaatgct cagggagatc gatttgagta ctaataagac 240  
 tccagtctcc tgcacaagca gctctgtgta ctcttccctt attgcaattc ctgtcttgat 300  
 aaatcggctc tgtgtaggcg gcggaagaag tgaacctgtt gggcggttac caccctctgtc 360  
 gtgtgtgaca gttgntttga atctctaatt gctcagtaca gatccacatg cagggttaagt 420  
 aagaagcttt tgaagaaaat ggaaagtctt aagtgatggc ttccaagaaa tcaaacctac 480  
 attaattagg gaacaacgga ctttacgtat cacaaatgaa gagactgacn aagtaaatca 540  
 acttggcctt ttctta 556

<210> 157  
 <211> 333

<212> DNA  
<213> Homo sapien

<220>  
<221> misc\_feature  
<222> (1)...(333)  
<223> n = A,T,C or G

<400> 157  
gggccacaaa aatatatnaa ataagctgga tatataaaan caaacactta acatngncan 60  
cattccttca gttattcaaa ctactgata nctaacnggg agnagttggn attctggaag 120  
acttcctaag ctaaaagtat atttacatat ttacaacaca ngtaaataata acngaagaac 180  
tacttcaaat aangnngaaa ttccagaatt ctanagattt atagctatag ntnacaanta 240  
tcaccaattg gtttgcaatc aanngnccag cactacttat gannaangtt taactannaa 300  
accaaagggg gagaaaacct ggnagggaaa nat 333

<210> 158  
<211> 629  
<212> DNA  
<213> Homo sapien

<220>  
<221> misc\_feature  
<222> (1)...(629)  
<223> n = A,T,C or G

<400> 158  
tcgagcgccc gcccgggcag gtctggtaca tttgtgagag gtccggcact ctgttctcat 60  
ccagtaagtg gtcgagccct ttctgcagaa ttgctgttaa atgttctcct aatagctgtt 120  
tctccacaca agcaatcagt ggtttctgtg tgctgtggtc caagtaagtg attactctgt 180  
ctccctcttc ttctaagcgt ttacttacat ggtaagata ttctggaacc tctctttcct 240  
gcattaacct ttggccttcg gcagcatata agcaattagt ctcttccaaa aatttcagtt 300  
caaatgaatc ttatataacc tgcaggtcag acagcatgcc caggagggt cgcgaacagg 360  
ctccgggtcca cggcctcgcc gctcctctcg cgctcgatca gcagtaggat tccatcaatg 420  
gttttactct gaaccatttt atcactaata atatgggttc taaacagttc taatcccata 480  
tcccagatgg agggcagcgt ggagttctgc agcacatagg tgcggtccaa gaacaggaag 540  
atgcttctga tcatgaatca tttgnctggc aatggctctg ccagcacgtg gtaatctttc 600  
ttttaaaaat aaacccttat ctaaacgtc 629

<210> 159  
<211> 629  
<212> DNA  
<213> Homo sapien

<220>  
<221> misc\_feature  
<222> (1)...(629)  
<223> n = A,T,C or G

<400> 159  
tcgagcgccc gcccgggcag gttctagagg ganaatctgg ctgatttggg aataaaatat 60  
aatcgaatat tcaacaccat gaagataaat cttattttgg aaatctactg accttaatac 120  
cccaagcttg ccctgaatac tttgattgga attggaatat atcaaaaaag gttagtattt 180  
ttgtttagt taggatacta aaaggatatt agttacccaa gagatccaat ttgtttttct 240  
gatgaatagt gttcagtaaa atgaagcagt cttaagagtg actaataatt tcaaagtgat 300

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ttttcgtcta ttcttaatat tttttaatta tttattttta agagttttat accttgagca 360
gatacaatga tccgcttttag tgagaggaca atttctgatt gattgttttc tcttcaggcc 420
atctcacctc ttcatctctt tgttacattt gaagcagttg atataatggg tttatacttt 480
aaaagataga catggtgccca tgaagtttgg ggaagttggg tgaattatcc cattctagtt 540
acagangagc tttccttaaa tgccctttac ttctangttt ggtcaagaag tcattttctg 600
agtaaaagtt attttcatat atgttgggg 629

```

<210> 160

<211> 519

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1)...(519)

<223> n = A,T,C or G

<400> 160

```

tcgagcggcg cgcccgggca ggtctgctgg gattaatgcc aagtntttca gccataaggt 60
agcgaatct agcagaatcc agattacatc cacttccaat cacgcggtgt ttgggtaatc 120
cacttagttt ccagataaca tacgtaagaa tgtccactgg gttggaaacc acaattatga 180
tgcaatcagg actgtacttg acgatctgag gaataatgaa tttgaagaca ttaacatttc 240
tctgcaccag attgagccga ctctccctt cttgctgacg gactcctgca gttaccacta 300
caatcttana attgggcggg tcacagaata atctttatct gccacaattt taggtgctga 360
agaaataagc tcccatgctg cagatccatc atttctnctt taagcttatc ttccaaaaca 420
tccacaagan caangttcat cagccagaga ctttcccaga atgctgatag nacacgccat 480
accaacttgt ccaacancca ctacagcgat cttattggg 519

```

<210> 161

<211> 446

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1)...(446)

<223> n = A,T,C or G

<400> 161

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cgagnggccc gcccgggcag gtccagtaag cntttnacga tgatgggaaa ggttatgcaa 60
gggtcccagcg gtacaacgag ctgtttctac atcatttgta ttctgcatgg tacgtacaat 120
agcagacacc atctgaggag aacgcatgat agcgtgtctg gaagcttcct ttttagaaag 180
ctgatggacc ataactgcag cttattaac caccacctgg tcctcgatcat ttagcagttt 240
tgtcagttca gggattgcac gtgtggcang ttctgcatca tcttgatagt taatcaagtt 300
tacaactggc atgtttcagc atctgcatg ggtcagcaa acgctggaca ttantgggat 360
gagcagcatc aaactgtgta natgggatct gcatgccctc atctaattgtc tcagggaaca 420
tagcagctcg taccctctga gctcga 446

```

<210> 162

<211> 354

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1) ... (354)

<223> n = A,T,C or G

<400> 162

agcgtngtcg	cggcccgang	tcttgggaag	cctttnttgc	tgagcctcac	agcctctgtc	60
aggcggctgc	ggatccagcg	gtccaccagg	ctctcatggc	ctccgggctg	ggaggngggg	120
gagggcacaa	aacccttccc	aaggccacga	angggcaaact	tggtggcatt	ccanagcttg	180
ttgcanaagt	ggcggnnaacc	cagtatccgg	ttcacatcca	ggntgatgtc	acgaccctgg	240
gacatgtang	cacataatcc	aaaccggaga	gcatcggtgc	cacattcacg	aatccccgct	300
gggaagtcag	ctttctgccc	ttctttggcc	ttctccacct	cgctggggatc	cagg	354

<210> 163

<211> 258

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1) ... (258)

<223> n = A,T,C or G

<400> 163

tttttcncca	agtcctcttg	ccgnggggatc	tngactgcaa	tttaagacac	ttctaattag	60
ttatacccag	gccctgcaaa	attgctgggt	ttatataata	tattcttgct	gcacgaagat	120
ttattattct	gttggatgat	tctattttaa	ttntatttat	tctggccaaa	aaagaacctt	180
ctccgctcgt	caagagangc	caatntgtct	tgaaggacaa	gagaaagatg	ctaacacaca	240
ctttcttctt	cttgagga					258

<210> 164

<211> 282

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1) ... (282)

<223> n = A,T,C or G

<400> 164

ggaacatatt	actttttaa	tacttgggtc	aatgaaacat	ttaataaaaa	catttgcttc	60
tctatataat	acgtatgtat	aaaataagcc	ttttcanaaa	ctctggttct	cataatcctc	120
tataaatcan	atgatctgac	ttctaagagg	aacaaattac	agnaaggggt	atacattnat	180
gaatactggt	agtactagag	ganngacgct	aaaccactct	actaccactt	gcggaactct	240
cacagggtaa	atgacaaagc	caatgactga	ctctaaaaac	aa		282

<210> 165

<211> 462

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1) ... (462)

<223> n = A,T,C or G

<400> 165  
gcccgggcan gtcctgtaat cccagctact canganctg agtcatgana atcgctgaa 60  
tccgggaggt agaggccgca gcgagcaaaag attaagccac tgcactccag tctgggtgac 120  
agagtgagaa tctgtctgtt gtcctctctg cattggctctg aaatgggttt gtagaacatg 180  
ccacagaagg accagcanca gcaacaaatg gatttggtgga angcgtagct ccaaattggag 240  
cangcacact tgatgaagca cgctgtgtct gtgcagangc aaccactggc actgttccaa 300  
aaacattgct gctagcatta cttgtggaag tatacgcatt actggagggtg gctgcanaac 360  
tgaaaacgct gtctagttct gccanagctg catacttgnc tgaanatgca cttgactgac 420  
tgggaactga accacanaac caacaggacc ttacctgtg ga 462

<210> 166

<211> 365

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1)...(365)

<223> n = A,T,C or G

<400> 166  
cgtgggtcgc ggcncgangt ctgaaaccaa tccagaacta aacatcagca cacaaaaaat 60  
accaggatag atggaatcaa aagactctga agccaaaagg aggcctagggg gagcaactga 120  
acttagcaag ctgaggactt cagtgtccat catccgatcc tgcctgttaa caacaggctt 180  
atatgataga gatattccat ctgagctgga ggccattatc cttagcaaac taacacagaa 240  
cagaaaacca aatacatgtt ctcatttaga agtaggagct aaatgatgag aactcaagga 300  
cacaaagaaa ggaacaacag aactggggc ctacttgagg gtggaggggtg ggaggaggga 360  
gaaga 365

<210> 167

<211> 364

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1)...(364)

<223> n = A,T,C or G

<400> 167  
agcgtggtcg cggcgcgang tccagcccta gcttgctgt gactccgcct tcaactgggtg 60  
ctctctctaa aagttgctga ctctttactg tatctcccaa tccccactcc attggttcca 120  
taaggggagg ggtgtctcac tcaacatggt gttcctggta ccaagaactg gctgacgaag 180  
ctgggtgccg tggctcatgc ctgtaatccc agcacttttg ggaggccaag aagggcggat 240  
cacctgaggt ctggagttca agatcagcct gaccaacatg atgaaaccaa gtctccacta 300  
aaaatataaa acaattagcc aggcattggtg gtgggtgcct gnaatcccag ctactgggga 360  
ngct 364

<210> 168

<211> 447

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

51

&lt;222&gt; (1)...(447)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 168

ccccgggcag	tcaaaaccca	aaacctttca	ttttagccca	aaccagctca	tgattaggt	60
tacaaggata	acagaaccag	ttgtcaggac	gagcatttga	caagtaaaag	caattcttgc	120
aaagctgcag	ttcatccagc	tcatggcatg	tgtctttata	tagcatcctc	gcaatgtcag	180
cttgctcact	gtctgtctca	tagaaaatca	cggtattgtg	gagaagcaat	tgggcatcag	240
ctttgaactc	ttcataactt	cggtatttcc	cttcattcac	tttctcttga	atgggtgggaa	300
cgtccacaga	cctcggccgc	gaccacgcta	agcccgaatt	ctgcagatat	ccatcacact	360
ggcggccggt	cgagcatggc	atctagaagg	cccaattcgc	ctatagnag	tcgnattacc	420
aattcactgg	ccgtcgnntt	acaacgc				447

&lt;210&gt; 169

&lt;211&gt; 524

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(524)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 169

cgantngcgc	gcccgggcag	gtctgagcag	cctttctggn	tgctggacta	ttgggattgg	60
gttcattcaa	cagagactgt	atggatgtta	gaatggaaga	cacatcatag	gttggactcc	120
aacggttctg	aagtatgtcc	agacatatac	taccatctgc	atagactaag	aacaaagaag	180
taggtacatt	aaacgtaaca	agaccactaa	ggttttaaca	ttatagacaa	aacanaaata	240
gtcaaganta	ctttgctttt	gaagtttaaa	gattcctatg	ttgcttccca	gttaactgcc	300
taaaaagata	agncataacc	accactagt	aaataatcan	gatgatcaga	gaatgtcana	360
tgtgatcagt	ataaaaactg	angatattna	gtgtcatcct	ttggaaaagg	ctgccctatn	420
atccaggaaa	tcanaaacat	tnttgaacag	ggnccctagc	tatccacaga	catgtgggaa	480
attcattccc	caaatngtag	gctggatccc	ctatctgaaa	taac		524

&lt;210&gt; 170

&lt;211&gt; 332

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(332)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 170

tcganccgcn	cgcccgggca	ggtgacaaac	ctgttattga	agatgttggt	tctgatgagg	60
aanaanatca	gaagggatgg	tgacaagaan	aanaanaaga	agattaagga	aaagtacatc	120
gatcaagaag	agctcaacaa	aacaaagccc	atctggacca	gaaatccccg	cgatattact	180
aatgangagt	acggagaatt	ctataanagc	ttgaccaatg	actgggaaga	tcacttggca	240
gtgaagcatt	tttcagttga	nggacagttg	gaattcagag	cccttctatn	tgtcccacga	300
cgtgctcctt	ttgatctggt	tganancaga	aa			332

&lt;210&gt; 171

&lt;211&gt; 334

&lt;212&gt; DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1)...(334)

<223> n = A,T,C or G

<400> 171

cgagnggcnc gcccgggcag gtctgttgat agcgacttaa cagaaaagtc tagacaaaca	60
taagcataaa aaattacagt ctttctaccc ttgggaatgg ggagaaaaag gaatctctac	120
cccaagacca gaaataataa gtcctgtttc tggctcctgaa catccagaat tatggaggct	180
ttggcctgac accacattan aatttgggtct ggaaatcaaa ctttaganac angagatcgt	240
aagccatttt atactatcga cctaaattcc agtctaacgg ttcctttaca aagttgcgga	300
aagccctctt atatgctagc tgtaggaat atag	334

<210> 172

<211> 439

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1)...(439)

<223> n = A,T,C or G

<400> 172

agcgtgggtcg cggcccgang tctgcctata aaactagact tctgacgctg ggctccagct	60
tcattctcac aggtcatcat cctcatccgg gagagcagtt gtctgagcaa cctctaagtc	120
gtgctcatalc tgtgctgcca aagctgggtc catgacaact tctgggtggg cgagagcagg	180
catggcaaca aattccaagt tagggctctcc aatgagcttc ctagcaagcc agaggaaggg	240
cttttcaaag ttgtagttac ttttggcaga aatgtcgtag tactgaagat tcttctttcg	300
gtggaagaca atggatttcg ccttcacttt ctgccttaat atccactttg gtgccacaca	360
acacaatggg gatgntttca cacacttngn accanatctc tatgccagnt aggccatttt	420
ggaagnactt cganggtac	439

<210> 173

<211> 599

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1)...(599)

<223> n = A,T,C or G

<400> 173

cgatnggccg cccggggcagg tcctgtaaaa naggaaattc agacatcgta cgactcgtaa	60
ttgaatgtgg agctgactgc aatattttgt caaagcacca gaatagtgcc ctgcactttg	120
cgaagcagtc taacaatgtg cttgtgtacg acttgctgaa gaaccattta gagacacttt	180
caagagtagc agaagagaca ataaaggatt actttgaagc tcgccttgct ctgctagaac	240
cagtttttcc aatcgcatgt catcgactct gtgagggtcc agatttttca acagatttca	300
attaccaacc cccacagaac ataccagaag gctctggcat cctgctgttt atcttccatg	360
caaacttttt gggtaaagaa gttattgctc ggctctgtgg accgtgtagt gtacaagctg	420
tagttctgaa tgataaattt cagcttcctg tttttctggg tctcgtctg ttgtccaggc	480
tggagtgcag tggcgcgat tacagctcac tggagtcttg acttcccagg cacaagcaat	540



cctcccacct cagcctccta actacctggg actaaaaatg caccgccacc acattccgg 599

<210> 174

<211> 458

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1)...(458)

<223> n = A,T,C or G

<400> 174

tcgatttggc	cgcccgggca	ggtccatgcn	gnttntgccc	attcccatgg	ngcccgacaa	60
ncccatcccc	gaggccgaca	tcccatggt	catgttcatg	cccaccatgc	cctgggtcat	120
ccctgcgctg	ttccccagag	gggccattcc	catggtgccc	gtcattacac	cgggcatggt	180
cataggcatg	ggtcccccca	ggagagggtt	agnttgaggc	cggacaggaa	gcatgtttga	240
tggagaactg	aggttcacag	nctccaaaac	tttgagtcac	cacattcata	ggctgctgca	300
tattctgtct	gctgaatcca	ttgtatncag	tgatggcctg	ctggggnttt	ggaaggctng	360
cataccaggt	agtaagntcg	tctaggctga	tgtttacacc	tggggtcaga	ccaagtanga	420
gggcaagggt	ttgctgactg	attttctgga	cccatatc			458

<210> 175

<211> 1206

<212> DNA

<213> Homo sapien

<400> 175

ggcacgagga	agttttgtgt	actgaaaaag	aaactgtcag	aagcaaaaaga	aataaaatca	60
cagttagaga	acaaaaaagt	taaatgggaa	caagagctct	gcagtgtgag	gtttctcaca	120
ctcatgaaaa	tgaaaattat	ctcttacatg	aaaattgcat	gttgaaaaag	gaaattgccca	180
tgctaaaact	ggaaatagcc	acactgaaac	accaatacca	ggaaaaggaa	aataaatact	240
ttgaggacat	taagatttta	aaagaaaaga	atgctgaact	tcagatgacc	ctaaaactga	300
aagaggaatc	attaactaaa	agggcatctc	aatatagtgg	gcagcttaaa	gttctgatag	360
ctgagaacac	aatgctcact	tctaaattga	aggaaaaaca	agacaaaaga	atactagagg	420
cagaaattga	atcacaccat	cctagactgg	cttctgctgt	acaagaccat	gatcaaattg	480
tgacatcaag	aaaaagtcaa	gaacctgctt	tccacattgc	aggagatgct	tgtttgcaaa	540
gaaaaatgaa	tgttgatgtg	agtagtacga	tatataacaa	tgaggtgctc	catcaaccac	600
tttctgaagc	tcaaaggaaa	tccaaaagcc	taaaaattaa	tctcaattat	gccggagatg	660
ctctaagaga	aaatacattg	gtttcagaac	atgcacaaa	agaccaacgt	gaaacacagt	720
gtcaaatgaa	ggaagctgaa	cacatgtatc	aaaacgaaca	agataatgtg	aacaaacaca	780
ctgaacagca	ggagtctcta	gatcagaaat	tatttcaact	acaaaagcaaa	aatatgtggc	840
ttcaacagca	attagttcat	gcacataaga	aagctgacaa	caaaaagcaag	ataacaattg	900
atattcattt	tcttgagagg	aaaatgcaac	atcatctcct	aaaagagaaa	aatgaggaga	960
tatttaatta	caataaccat	ttaaaaaacc	gtatatatca	atatgaaaaa	gagaaagcag	1020
aaacagaagt	tatataatag	tataacactg	ccaaggagcg	gattatctca	tcttcacctc	1080
gtaattccag	tgtttgcac	gtggttggtg	aataaatgaa	taaagaatga	gaaaaccaga	1140
agctctgata	cataatcata	atgataatta	tttcaatgca	caactacggg	tggtgctgct	1200
cgtgcc						1206

<210> 176

<211> 317

<212> PRT

<213> Homo sapien

54

&lt;400&gt; 176

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Met Gly Thr Arg Ala Leu Gln Cys Glu Val Ser His Thr His Glu Asn
 1           5           10           15
Glu Asn Tyr Leu Leu His Glu Asn Cys Met Leu Lys Lys Glu Ile Ala
          20           25           30
Met Leu Lys Leu Glu Ile Ala Thr Leu Lys His Gln Tyr Gln Glu Lys
          35           40           45
Glu Asn Lys Tyr Phe Glu Asp Ile Lys Ile Leu Lys Glu Lys Asn Ala
          50           55           60
Glu Leu Gln Met Thr Leu Lys Leu Lys Glu Glu Ser Leu Thr Lys Arg
65           70           75           80
Ala Ser Gln Tyr Ser Gly Gln Leu Lys Val Leu Ile Ala Glu Asn Thr
          85           90           95
Met Leu Thr Ser Lys Leu Lys Glu Lys Gln Asp Lys Glu Ile Leu Glu
          100          105          110
Ala Glu Ile Glu Ser His His Pro Arg Leu Ala Ser Ala Val Gln Asp
          115          120          125
His Asp Gln Ile Val Thr Ser Arg Lys Ser Gln Glu Pro Ala Phe His
          130          135          140
Ile Ala Gly Asp Ala Cys Leu Gln Arg Lys Met Asn Val Asp Val Ser
145          150          155          160
Ser Thr Ile Tyr Asn Asn Glu Val Leu His Gln Pro Leu Ser Glu Ala
          165          170          175
Gln Arg Lys Ser Lys Ser Leu Lys Ile Asn Leu Asn Tyr Ala Gly Asp
          180          185          190
Ala Leu Arg Glu Asn Thr Leu Val Ser Glu His Ala Gln Arg Asp Gln
          195          200          205
Arg Glu Thr Gln Cys Gln Met Lys Glu Ala Glu His Met Tyr Gln Asn
          210          215          220
Glu Gln Asp Asn Val Asn Lys His Thr Glu Gln Gln Glu Ser Leu Asp
225          230          235          240
Gln Lys Leu Phe Gln Leu Gln Ser Lys Asn Met Trp Leu Gln Gln Gln
          245          250          255
Leu Val His Ala His Lys Lys Ala Asp Asn Lys Ser Lys Ile Thr Ile
          260          265          270
Asp Ile His Phe Leu Glu Arg Lys Met Gln His His Leu Leu Lys Glu
          275          280          285
Lys Asn Glu Glu Ile Phe Asn Tyr Asn Asn His Leu Lys Asn Arg Ile
          290          295          300
Tyr Gln Tyr Glu Lys Glu Lys Ala Glu Thr Glu Val Ile
305          310          315

```

&lt;210&gt; 177

&lt;211&gt; 20

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Made in the Lab

&lt;400&gt; 177

ccaatcatct ccacaggagc

&lt;210&gt; 178

&lt;211&gt; 1665

20

&lt;212&gt; DNA

&lt;213&gt; Homo sapien

&lt;400&gt; 178

```

gcaaactttc aagcagagcc tcccgagaag ccatctgcct tcgagcctgc cattgaaatg      60
caaaagtctg ttccaaataa agccttggaa ttgaagaatg aacaaacatt gagagcagat      120
cagatgttcc cttcagaatc aaaacaaaag aagggtgaag aaaattcttg ggattctgag      180
agtctccgtg agactgtttc acagaaggat gtgtgtgtac ccaaggctac acatcaaaaa      240
gaaatggata aaataagtgg aaaattagaa gattcaacta gcctatcaaa aatcttggat      300
acagttcatt cttgtgaaag agcaagggaa cttcaaaaag atcactgtga acaacgtaca      360
ggaaaaatgg aacaaatgaa aaagaagttt tgtgtactga aaaagaaact gtcagaagca      420
aaagaaataa aatcacagtt agagaaccaa aaagttaaat gggaacaaga gctctgcagt      480
gtgaggtttc tcacactcat gaaaatgaaa attatctctt acatgaaaat tgcattgtga      540
aaaaggaaat tgccatgcta aaactggaaa tagccacact gaaacaccaa taccaggaaa      600
aggaaaataa atactttgag gacattaaga ttttaaaaga aaagaatgct gaacttcaga      660
tgaccctaaa actgaaagag gaatcattaa ctaaaagggc atctcaatat agtgggcagc      720
ttaaagtctt gatagctgag aacacaatgc tcacttctaa attgaaggaa aaacaagaca      780
aagaaatact agaggcagaa attgaatcac accatcctag actggcttct gctgtacaag      840
accatgatca aattgtgaca tcaagaaaaa gtcaagaacc tgctttccac attgcaggag      900
atgcttggtt gcaaagaaaa atgaatgttg atgtgagtag tacgatatat aacaatgagg      960
tgctccatca accactttct gaagctcaaa ggaaatccaa aagcctaaaa attaattctca     1020
attatgccgg agatgctcta agagaaaata cattggtttc agaacatgca caaagagacc     1080
aacgtgaaac acagtgtcaa atgaaggaag ctgaacacat gtatcaaaac gaacaagata     1140
atgtgaacaa acacactgaa cagcaggagt ctctagatca gaaattatct caactacaaa     1200
gcaaaaaatg gtggcttcaa cagcaattag ttcatgcaca taagaaagct gacaacaaaa     1260
gcaagataac aattgatatt cttttctctg agaggaaaat gcaacatcat ctctctaaaag     1320
agaaaaatga ggagatattt aattacaata accattttaa aaaccgtata tatcaatatg     1380
aaaaagagaa agcagaaaca gaaaactcat gagagacaag cagtaagaaa cttcttttgg     1440
agaaacaaca gaccagatct ttactcacia ctcatgctag gaggccagtc cttagcattac     1500
cttatgttga aaatcttacc aatagtctgt gtcaacagaa tacttatttt agaagaaaaa     1560
ttcatgattt cttcttgaag cctgggagac agagcgagac tctgtctcaa aaaaaaaaaa     1620
aaaaaaaaagaa agaaagaaat gcctgtgctt acttcgcttc ccagg                      1665

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&lt;210&gt; 179

&lt;211&gt; 179

&lt;212&gt; PRT

&lt;213&gt; Homo sapien

&lt;400&gt; 179

```

Ala Asn Phe Gln Ala Glu Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro
 1           5           10          15
Ala Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys
 20          25          30
Asn Glu Gln Thr Leu Arg Ala Asp Gln Met Phe Pro Ser Glu Ser Lys
 35          40          45
Gln Lys Lys Val Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu Arg Glu
 50          55          60
Thr Val Ser Gln Lys Asp Val Cys Val Pro Lys Ala Thr His Gln Lys
 65          70          75          80
Glu Met Asp Lys Ile Ser Gly Lys Leu Glu Asp Ser Thr Ser Leu Ser
 85          90          95
Lys Ile Leu Asp Thr Val His Ser Cys Glu Arg Ala Arg Glu Leu Gln
100         105         110
Lys Asp His Cys Glu Gln Arg Thr Gly Lys Met Glu Gln Met Lys Lys
115         120         125

```

Lys Phe Cys Val Leu Lys Lys Lys Leu Ser Glu Ala Lys Glu Ile Lys  
 130 135 140  
 Ser Gln Leu Glu Asn Gln Lys Val Lys Trp Glu Gln Glu Leu Cys Ser  
 145 150 155 160  
 Val Arg Phe Leu Thr Leu Met Lys Met Lys Ile Ile Ser Tyr Met Lys  
 165 170 175  
 Ile Ala Cys

<210> 180  
 <211> 1681  
 <212> DNA  
 <213> Homo sapien

<400> 180  
 gatacagtc ttcctgtgaa agagcaaggg aacttcaaaa agatcactgt gaacaacgta 60  
 caggaataat ggaacaaatg aaaaagaagt tttgtgtact gaaaaagaaa ctgtcagaag 120  
 caaaaagaat aaaatcacag ttagagaacc aaaaagttaa atgggaacaa gagctctgca 180  
 gtgtgagatt gactttaaac caagaagaag agaagagaag aaatgccgat atattaaatg 240  
 aaaaaattag ggaagaatta ggaagaatcg aagagcagca taggaaagag ttagaagtga 300  
 aacaacaact tgaacaggct ctcagaatac aagatataga attgaagagt gtagaaagta 360  
 atttgaatca gggtttctcac actcatgaaa atgaaaatta tctcttacat gaaaattgca 420  
 tgttgaaaaa ggaaattgcc atgctaaaac tggaaatagc cactactgaaa caccaataacc 480  
 aggaaaagga aaataaatac tttgaggaca ttaagatttt aaaagaaaag aatgctgaac 540  
 ttcagatgac cctaaaactg aaagaggaat cattaactaa aagggcactc caatatagtg 600  
 ggcagcttaa agttctgata gctgagaaca caatgctcac ttctaaattg aaggaaaaac 660  
 aagacaaaga aatactagag gcagaaaattg aatcacacca tcctagactg gcttctgctg 720  
 tacaagacca tgatcaaatt gtgacatcaa gaaaaagtca agaacctgct ttccacattg 780  
 caggagatgc ttgtttgcaa agaaaaatga atgttgatgt gagtagtacg atatataaca 840  
 atgaggtgct ccatcaacca ctttctgaag ctcaaaggaa atccaaaagc ctaaaaatta 900  
 atctcaatta tgccggagat gctctaagag aaaatacatt ggtttcagaa catgcacaaa 960  
 gagaccaacg tgaaacacag tgtcaaatga aggaagctga acacatgtat caaaacgaac 1020  
 aagataatgt gaacaaacac actgaacagc aggagctctc agatcagaaa ttatttcaac 1080  
 tacaagcaa aaatatgtgg cttcaacagc aattagttca tgcacataag aaagctgaca 1140  
 acaaaagcaa gataacaatt gatattcatt ttcttgagag gaaaatgcaa catcatctcc 1200  
 taagaagaaa aaatgaggag atatttaatt acaataacca tttaaaaaac cgtatatatc 1260  
 aatatgaaaa agagaaagca gaaacagaaa actcatgaga gacaagcagt aagaaacttc 1320  
 ttttgagaaa acaacagacc agatctttac tcacaactca tgctaggagg ccagtcctag 1380  
 cattacctta tgttgaaaaa tcttaccat agtctgtgtc aacagaatac ttattttaga 1440  
 agaaaaattc atgatttctt cctgaagcct acagacataa aataacagtg tgaagaatta 1500  
 cttgttcacg aattgcataa aagctgcccc ggatttccat ctaccctgga tgatgccgga 1560  
 gacatcattc aatccaacca gaatctcgct ctgtcactca ggctggagtg cagtgggcgc 1620  
 aatctcggct cactgcaact ctgcctcccc gggtcacgcc attctctggc acagcctccc 1680  
 g 1681

<210> 181  
 <211> 432  
 <212> PRT  
 <213> Homo sapien

<400> 181  
 Asp Thr Val His Ser Cys Glu Arg Ala Arg Glu Leu Gln Lys Asp His  
 1 5 10 15  
 Cys Glu Gln Arg Thr Gly Lys Met Glu Gln Met Lys Lys Lys Phe Cys  
 20 25 30

57

Val Leu Lys Lys Lys Leu Ser Glu Ala Lys Glu Ile Lys Ser Gln Leu  
 35 40 45  
 Glu Asn Gln Lys Val Lys Trp Glu Gln Glu Leu Cys Ser Val Arg Leu  
 50 55 60  
 Thr Leu Asn Gln Glu Glu Glu Lys Arg Arg Asn Ala Asp Ile Leu Asn  
 65 70 75 80  
 Glu Lys Ile Arg Glu Glu Leu Gly Arg Ile Glu Glu Gln His Arg Lys  
 85 90 95  
 Glu Leu Glu Val Lys Gln Gln Leu Glu Gln Ala Leu Arg Ile Gln Asp  
 100 105 110  
 Ile Glu Leu Lys Ser Val Glu Ser Asn Leu Asn Gln Val Ser His Thr  
 115 120 125  
 His Glu Asn Glu Asn Tyr Leu Leu His Glu Asn Cys Met Leu Lys Lys  
 130 135 140  
 Glu Ile Ala Met Leu Lys Leu Glu Ile Ala Thr Leu Lys His Gln Tyr  
 145 150 155 160  
 Gln Glu Lys Glu Asn Lys Tyr Phe Glu Asp Ile Lys Ile Leu Lys Glu  
 165 170 175  
 Lys Asn Ala Glu Leu Gln Met Thr Leu Lys Leu Lys Glu Glu Ser Leu  
 180 185 190  
 Thr Lys Arg Ala Ser Gln Tyr Ser Gly Gln Leu Lys Val Leu Ile Ala  
 195 200 205  
 Glu Asn Thr Met Leu Thr Ser Lys Leu Lys Glu Lys Gln Asp Lys Glu  
 210 215 220  
 Ile Leu Glu Ala Glu Ile Glu Ser His His Pro Arg Leu Ala Ser Ala  
 225 230 235 240  
 Val Gln Asp His Asp Gln Ile Val Thr Ser Arg Lys Ser Gln Glu Pro  
 245 250 255  
 Ala Phe His Ile Ala Gly Asp Ala Cys Leu Gln Arg Lys Met Asn Val  
 260 265 270  
 Asp Val Ser Ser Thr Ile Tyr Asn Asn Glu Val Leu His Gln Pro Leu  
 275 280 285  
 Ser Glu Ala Gln Arg Lys Ser Lys Ser Leu Lys Ile Asn Leu Asn Tyr  
 290 295 300  
 Ala Gly Asp Ala Leu Arg Glu Asn Thr Leu Val Ser Glu His Ala Gln  
 305 310 315 320  
 Arg Asp Gln Arg Glu Thr Gln Cys Gln Met Lys Glu Ala Glu His Met  
 325 330 335  
 Tyr Gln Asn Glu Gln Asp Asn Val Asn Lys His Thr Glu Gln Gln Glu  
 340 345 350  
 Ser Leu Asp Gln Lys Leu Phe Gln Leu Gln Ser Lys Asn Met Trp Leu  
 355 360 365  
 Gln Gln Gln Leu Val His Ala His Lys Lys Ala Asp Asn Lys Ser Lys  
 370 375 380  
 Ile Thr Ile Asp Ile His Phe Leu Glu Arg Lys Met Gln His His Leu  
 385 390 395 400  
 Leu Lys Glu Lys Asn Glu Glu Ile Phe Asn Tyr Asn Asn His Leu Lys  
 405 410 415  
 Asn Arg Ile Tyr Gln Tyr Glu Lys Glu Lys Ala Glu Thr Glu Asn Ser  
 420 425 430

&lt;210&gt; 182

&lt;211&gt; 511

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 182

```

gaagtttcat gaggttttagc ttttctgggc tggggagtg agagaaagaa gttgcagggc 60
ttacaggaaa tcccagagcc tgaggtttcc tcccagattt gagaactcta gattctgcat 120
cattatcttt gagtctatat tctcttgggc tgtaagaaga tgaggaatgt aataggctctg 180
ccccaaagcct ttcattgcctt ctgtaccaag cttgtttcct tgtgcatcct tcccaggctc 240
tggtcgcccc ttattggaga atgtgatttc caagacaatc aatccacaag tgtctaagac 300
tgaatacaaa gaacttcttc aagagttcat agacgacaat gccactacaa atgccataga 360
tgaattgaag gaatgttttc ttaaccaaac ggatgaaact ctgagcaatg ttgagggtgtt 420
tatgcaatta atatatgaca gcagtctttg tgatttattt taactttctg caagaccttt 480
ggctcacaga actgcagggt atggtgagaa a

```

511

&lt;210&gt; 183

&lt;211&gt; 260

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 183

```

cacctcgagg ttcagctcct ctgtcttggt gaagaacccat tcctcgccat ccttgcgggtt 60
cttctctgcc atcttctcat actggtcacg catctcgttc agaatgcggc tcagggtccac 120
gccagggtgca gcgtccatct ccacattgac atctccaccc acctggcctc tcagggtcatt 180
catctcctcc tcgtgggttct tcttcaggta ggccagctcc tccttcaggc tctcaatctg 240
catctccagg tcagctctgg

```

260

&lt;210&gt; 184

&lt;211&gt; 461

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 184

```

gtctgatggg agaccaaaga atttgcaagt ggatgggttg gtatcactgt aaataaaaag 60
agggcctttt ctactgttat gactgttact tgaccttctt tgaaaagcat tcccaaaatg 120
ctctatttta gatagattaa cattaaccaa cataattttt tttagatcga gtcagcataa 180
atttctaagt cagcctctag tcgtgggttca tctctttcac ctgcatttta tttgggtgtt 240
gtctgaagaa aggaaagagg aaagcaaata cgaattgtac tatttgtacc aaatctttgg 300
gattcattgg caaataattt cagtgtggtg tattattaaa tagaaaaaaa aaattttgtt 360
tcctagggtg aagggtcta tgaatccgtt tgacttatga tgaccattta tgcactttca 420
aatgaatttg ctttcaaaat aaatgaagag cagacctcgg c

```

461

&lt;210&gt; 185

&lt;211&gt; 531

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 185

```

tctgatttta tttccttctc aaaaaaagtt atttacagaa ggtatatatc aacaatctga 60
caggcagtgga acttgacatg attagctggc atgatttttt cttttttttc ccccaaacat 120
tgtttttgtg gccttgaatt ttaagacaaa tattctacac ggcattattgc acaggatgga 180
tggaacaaaa aagtttaaaa acaaaaaccc ttaacggaac tgccttaaaa aggcagacgt 240
cctagtgcct gtcattgtat attaaacata catacacaca atctttttgc ttattataat 300
acagacttaa atgtacaaa atgtttttcc cttttttcaa tttttaaaca caacagctat 360
aaacctgaac acatattgta tcatcattcc ataagactaa aacaattata tttagcgaca 420
agtagaaagg attaaatagt caaatacaag aatgaaaaac gcagtacata gtgtcgcgaa 480
ctcaaatcgg catttagata gatccagtg tttaaacggc acgtttttgc t

```

540

<210> 186  
<211> 441  
<212> DNA  
<213> Homo sapiens

<400> 186  
cattcctttc ctcgcgttgg gggtttctctg tgtcagcgag cctcgggtaca ctgatttccg 60  
atcaaaagaa tcatcatctt taccttgact ttctcaggaa ttactgaact ttcttctcag 120  
aagatagggc acagccattg ccttggcctc acttgaaggg tctgcatttg ggctcctctg 180  
tctcttgcca agtttcccaa ccactcgagg gagaaatata gggagggttg acttcctccg 240  
gggctttccc gagggcttca ccgtgagccc tgcggccctc agggctgcaa tcctggattc 300  
aatgtctgaa acctcgctct ctgcctgctg gacttctgag gccgtcactg ccactctgtc 360  
ctccagctct gacagctcct catctgtggt cctgttgtag tggacggggt ccccagggtc 420  
ctgggggctt ttttctgtc t 441

<210> 187  
<211> 371  
<212> DNA  
<213> Homo sapiens

<400> 187  
aaaagtgaat gagtaactat tatattgttg gcaataataa gttgcaaaat catcaggctg 60  
caggctgctg atggtgagag tgaactctgt cccagatcca ctgccgctga accttgatgg 120  
gacccagat tctaaactag acgccttatg gatcaggagc tttggggctt tccctggttt 180  
ctgttgatac caggccaacc aactactaac actctgactg gcccggaag tgatggtgac 240  
tctgtctcct acagtgcag acagggtgga aggagactgg gtcatctgga tgtcacattt 300  
ggcacctggg agccagagca gcaggagccc caggagctga gcggggaccc tcatgtccat 360  
gctgagtcct g 371

<210> 188  
<211> 226  
<212> DNA  
<213> Homo sapiens

<400> 188  
gggtatataaa ttgagatgcc cccccaggcc agcaaagtgt cctttttgtt caaagtctat 60  
ttttattcct tgatattttt cttttttttt tttttgtgga tggggacttg tgaatttttc 120  
taaagggtgct atttaacatg ggaggagagc gtgtgcggct ccagcccagc ccgctgctca 180  
ctttccaccc tctctccacc tgcctctggc ttctcaggac ctgccc 226

<210> 189  
<211> 391  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(391)  
<223> n=A,T,C or G

<400> 189  
tgggtgaagt ttattctgtt ttcacatcta ggttggtggg ganagtgata gacaaagttc 60  
tggattctgg gcatcgctcg cgcattcttg taatcctact tgggaggttg anacaggaga 120  
cctcgccgc naccacgcta agggcgaatt ctgcanatat ccatcacact ggcggccgct 180  
cgagcatgca tctanagggc ccaattcncc ctatagttag ncgtattaca attcactggc 240

60

cgctcgtttta caacgtcgtg actgggaaaa ccctggcggt acccaactta atcgccctgc 300  
agcacatccc cctttcncca gctggcttaa tancgaagag gcccgcaccg atcgcccttc 360  
ccaacanttg cgcagcctga atggcgaatg g 391

&lt;210&gt; 190

&lt;211&gt; 501

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 190

catcttggcc tttttgagct gtttccgctt cttctcatcc cggtcactgt caccctcatt 60  
actggaggag ctggcagagg cggtgctgtc aaactcctct gccacatctt cctcctcttc 120  
acctgggttg aatgactcat cggtttcttc tcctgagtca tcgctgctgt cattggcatt 180  
ctcctcccgg atcttgccct cctccttcat cctctccaag taggcacat gctggtcctc 240  
atcagagtca gcatattcat cgtagcttgg gttcatgccc tctttcaatc ctcggttttt 300  
gatgttgagc tttttcgcgt tgacaaaatc aaacagtttc ccgtactcct ccctctcaat 360  
gctgctgaag gtatactgag tgccctgctt ggtctcaatt tcaaagtcaa aggaacgagt 420  
agtagtggtg ccacgagcaa agttgacaaa ggagatctca tcgaagcgga tgtgcacagg 480  
tggttgtgg acgtagatga a 501

&lt;210&gt; 191

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (49)

&lt;223&gt; n=A,T,C or G

&lt;400&gt; 191

ggaaaaactg tgaaaaatat atctgaattht attaatgaca gtataaaaana gggttgtggc 60  
aacagaaagt aaaaaactaac atggattgct ataaatatgc tgaagcctag ttgttcaaat 120  
gatacaattc tctcatgcta ctctaaagtt tataaagaaa aaggatttac actttacaca 180  
ctgtacacaa aaggaataacc ttctgagagc cagggagtgg ggaaagggga aggagacttg 240  
a 241

&lt;210&gt; 192

&lt;211&gt; 271

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(271)

&lt;223&gt; n=A,T,C or G

&lt;400&gt; 192

tggtcntgga ttcacanata aantanatcg actaaaactg gcagaaattg tgaagcaggt 60  
gatagaagan caaaccacgt cccacgaatc ccaataatga cagcttcaga ctttgctttt 120  
ttaacaattt gaaaattat tctttaatgt ataaagtaat tttatgtaaa ttaataaatc 180  
ataatttcat ttccacattg attaaagctg ctgtatagat ttagggngca ggacttaata 240  
atagnggaaa tgaaattatg atttattaat c 271

&lt;210&gt; 193



<211> 351  
<212> DNA  
<213> Homo sapiens

<400> 193  
agtcgagggcg ctgatcccta aaatggcgaa catgtgtttt catcatttca gccaaagtcc 60  
taacttcctg tgccttttcct atcacctcga gaagtaatta tcagttgggt tggatttttg 120  
gaccaccgtt cagtcatttt ggggtgcccgt gctcccaaaa cattttaaat gaaagtattg 180  
gcattcaaaa agacagcaga caaaatgaaa gaaaatgaga gcagaaagta agcatttcca 240  
gcctatctaa tttcttttagt tttctatttg cctccagtgc agtccatttc ctaatgtata 300  
ccagcctact gtactattta aaatgctcaa tttcagcacc gatggacctg c 360

<210> 194  
<211> 311  
<212> DNA  
<213> Homo sapiens

<400> 194  
ctgagacaca gaggcccact gcgaggggga cagtggcggt gggactgacc tgctgacagt 60  
caccctccct ctgctgggat gaggtccagg agccaactaa aacaatggca gaggagacat 120  
ctctgggtgtt cccaccaccc tagatgaaaa tccacagcac agacctctac cgtgtttctc 180  
ttccatccct aaaccacttc cttaaaatgt ttggatttgc aaagccaatt tggggcctgt 240  
ggagcctggg gttggatagg gccatggctg gtccccacc atacctcccc tccacatcac 300  
tgacacagac c 311

<210> 195  
<211> 381  
<212> DNA  
<213> Homo sapiens

<400> 195  
tgtcagagtg gcaactgtag aagttccagg aaccctgaac tgtaaggggt cttcatcagt 60  
gccaaacagga tgacatgaaa tgatgtactc agaagtgtcc tggaatgggg cccatgagat 120  
ggttgtctga gagagagctt cttgtcctgt ctttttcctt ccaatcaggg gctcgctctt 180  
ctgattattc ttcagggcaa tgacataaat tgtatattcg gttcccgggt ccaggccagt 240  
aatagtagcc tctgtgacac cagggcgggg ccgagggacc acttctctgg gaggagaccc 300  
aggcttctca tacttgatga tgtagccggt aatcctggga cgtggcgggt gccatgatac 360  
cagcagggaa ttgggtgtgg t 381

<210> 196  
<211> 401  
<212> DNA  
<213> Homo sapiens

<400> 196  
cacaacaag aggagcacca gacctcctdt tggcttcgag atggcttcgc cacaccaaga 60  
gcccacacct ggagacctga ttgagatttt ccgccttggc tatgagcact gggccctgta 120  
tataggagat ggctacgtga tccatctggc tcctccaagt gagtaccccc gggctggctc 180  
ctccagtgtc ttctcagtc tgagcaacag tgcaaggtg aaacgggagc gcctggaaga 240  
tgtggtggga ggctgttgct atcgggtcaa caacagcttg gaccatgagt accaaccacg 300  
gcccgtggag gtgatcacca gttctgcgaa ggagatgggt ggtcagaaga tgaagtacag 360  
tattgtgagc aggaactgtg agcactttgt caccagacc t 401

<210> 197  
<211> 471

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 197

```
ctgtaatgat gtgagcaggg agccttcctc cctgggccac ctgcagagag ctttcccacc 60
aactttgtac cttgattgcc ttacaaagtt atttgtttac aaacagcgac catataaaaag 120
cctcctgccc caaagcttgt gggcacatgg gcacatacag actcacatac agacacacac 180
atatatgtac agacatgtac tctcacacac acaggcacca gcatacacac gtttttctag 240
gtacagctcc caggaacagc taggtgggaa agtcccatca ctgagggagc ctaaccatgt 300
ccctgaacaa aaattgggca ctcatctatt ccttttctct tgtgtcccta ct cattgaaa 360
ccaaactctg gaaaggaccc aatgtaccag tatttatacc tctagtgaag cacagagaga 420
ggaagagagc tgcttaaact cacacaacaa tgaactgcag acacagacct g 480
```

&lt;210&gt; 198

&lt;211&gt; 201

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 198

```
ggtccattga ggctctgtcg gccatgccca cagttcgaag ctttgccaac gaggagggcg 60
aagcccagaa gtttagggaa aagctgcaag aaataaagac actcaaccag aaggaggctg 120
tggcctatgc agtcaactcc tggaccacta gtatttcagg tatgctgctg aaagtgggaa 180
tcctctacat tggtaggcag a 201
```

&lt;210&gt; 199

&lt;211&gt; 551

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 199

```
tctggcacag atcttcaccc acacggcggt ccacgtgctg atcatcttcc gggctctcacc 60
gggcctggaa cacaccatct tccccatgag cccggtgccc agtctggtga cttccatctt 120
ggcccctggc cttatgtccc agttatgacc cctgacttca actctggctc ttaccctgta 180
actccagtcc atctctgaca tttttaacac ccggccttgt gaccgtggac atagctcctg 240
acctcgattc ccactctgag ccagtggtta gtccatgaga tcatgacctg actcctgggtc 300
tccaaccttg tgatcctaatt tctgggacct caatcctagc ctctgaactt gggaccctgg 360
agctcctgac cttagtctg accgctaccc ttgattctga cctttgatcc tgtaacttag 420
gggtggcccc tgaccttatt actgtcattt agctccttga ccttgccact tcaatcctgg 480
ctttatgacc tcctactctc aattttaact ttaaccaaact gaccaaattt gtgacactaa 540
atgaccacaa t 551
```

&lt;210&gt; 200

&lt;211&gt; 211

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(211)

&lt;223&gt; n=A,T,C or G

&lt;400&gt; 200

```
cagctcancg ggcgacatgc ccctacaagt tggcanaagn ggctgccact gctggggttg 60
tgtaagagag gctgctgnca ccattacctg cagaaacctt ctcatagggg ctacgatcgg 120
tactgctagg gggcacatag cgcccatggg tgtggtaggt ggggnactcn ntataggat 180
```

ggtaggtatc ccgggctgga aanatgnnca g

211

<210> 201

<211> 111

<212> DNA

<213> Homo sapiens

<400> 201

ccagtgaaag gaaacaaaac tggcagtttg tccatttgaa tatcagacct agttttcttct 60  
taatttccac actatttctc ccatattcct taaacttctt ggcatccacc t 120

<210> 202

<211> 331

<212> DNA

<213> Homo sapiens

<400> 202

tgaaaataca gaataccagg tgggtcccaaa tgtttgaagt tctttgaaca gaaagagaga 60  
ggagagagag agagaggaaa attccctaac ccttgggtta aagacaatat tcattttattg 120  
ctcaaatgat gcttttaagg gaggacagtg gaataaaata aacttttttt ttctccctac 180  
aatacataga agggttatca aaccactcaa gtttcaaaat ctttccaggg tccaatatca 240  
ctttttttct ttcggttcaa tgaaaagcta aatgtaataa tactaattat agataaaatt 300  
ttattttact ttttaaaaat ttgtccagac c 331

<210> 203

<211> 491

<212> DNA

<213> Homo sapiens

<400> 203

agtcacccag tctacttagt acctgggtgc tgcctctgac cttttcagct tgataccctg 60  
ggcttttagtg taaccaataa atctgtagtg accttacctg tattccctgt gctatcctgt 120  
gggaaggtag gaatgggcta agtatgatga atgtataggt tagggatctt ttggttttaa 180  
atcacagaaa acctaatca aactggctta aaataaaaag gattttattgg ttcagttaac 240  
tagaaagtcc ataggttagtg ctggctccag gtgaagactt gacccagtag ttcagtatgt 300  
ctctaaatac cggactgact tttttctcac tgttgcactt tctgtaggac catttaagtc 360  
tggggccactt aatggctgcc agcattccta agattacact tttccccatt tatgtccaat 420  
cagaaaaaga aggcattctt gtaccagaaa tctcagcaaa agccctaata ttcacactga 480  
ttaggacctg c 491

<210> 204

<211> 361

<212> DNA

<213> Homo sapiens

<400> 204

tcccttcctc ccccatgtga taaatgggtc cagggtgat caaagaactc tgactgcaga 60  
actgccgctc tcagtggaca gggcatctgt taccctgaga cctgtggcag acacgtcttg 120  
ttttcatttg atttttgta agagtgcagt attgcagagt ctagaggaat ttttgtttcc 180  
ttgattaaca tgattttcct ggttggtaca tccagggcat ggcagtggcc tcagccttaa 240  
acttttggtc ctactccac cctcagcgaa ctgggcagca cggggagggt ttggctacce 300  
ctgcccaccc ctgagccagg taccaccatt gtaaggaaac actttcagaa attcagacct 360  
c 361

<210> 205

64

<211> 471  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (2)  
<223> n=A,T,C or G  
<221> misc\_feature  
<222> (3)  
<223> n=A,T,C or G

<400> 205  
cnnngtacagt tcttcctgga tggccgacac agatcctggg gaaaggcaat cctggcactg 60  
ctctgaaacc agagctcctc ctccctcccc gggcagggtg gagctgagaa gggctgctct 120  
agcgttggga ctccacctcc atacacctga tattttgata gggcagggtc ctgctatggg 180  
ccactgttct gggcagtata gtatgcttga cagcatcctt ggcattctat caccagatcc 240  
cagagcaccg gctactagct gtgacaacat cctccaaaca ttgcaaaatt tccccggga 300  
ggcaagattg cctcagatgg gagaatcacg ctctagggaa atctgctggt atgagaaccc 360  
caactcccca ctccactgag cctccagatg gcgagcaggc tgcagctcca gcacagacac 420  
gaagctccct ccagccactg acggtccatg gctgggggta cccaggacct c 480

<210> 206  
<211> 261  
<212> DNA  
<213> Homo sapiens

<400> 206  
tagagtattt agagtcctga gataacaagg aatccaggca tccttttagac agtcttctgt 60  
tgtcctttct tcccaatcag agatttgtgg atgtgtggaa tgacaccacc accagcaatt 120  
gtagccttga tgagagaatc caattcttca tctccacgaa tagcaagttg caagtgcga 180  
ggggttaatac gctttacctt taagtctttt gatgcatttc ctgccagttc aagtacctct 240  
gcggtgaggt actccaggat g 261

<210> 207  
<211> 361  
<212> DNA  
<213> Homo sapiens

<400> 207  
gctctccggg agcttgaaga agaaactggc tacaaagggg acattgccga atgttctcca 60  
gcggtctgta tggaccagg cttgtcaaac tgtactatac acatcgtgac agtcaccatt 120  
aacggagatg atgccgaaaa cgcaaggccg aagccaaagc caggggatgg agagtttgtg 180  
gaagtcattt ctttacccaa gaatgacctg ctgcagagac ttgatgctct ggtagctgaa 240  
gaacatctca cagtggacgc caggggtctat tcctacgctc tagcactgaa acatgcaaat 300  
gcaaagccat ttgaagtgcc cttcttgaaa ttttaagccc aaatatgaca ctggacctgc 360  
c 361

<210> 208  
<211> 381  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature

<222> (1)...(381)

<223> n=A,T,C or G

<400> 208

```
agaggagatn tttgccatgc ctgaatnctt tcctatncca ccctancact taacatatta 60
cttagtctgc tttgntaaaa gcaagtatta ccttnaactt gncctttact ctttgccctt 120
tagctaacta ataaagnttg atntaggcat tattatataa ttctgagtca ttcattggtat 180
ctctcatggt tgatgtatct tncaaactaa gatctatgat agtttttttt ccanagttcc 240
attaaatcat ttatttcctt tactttctca cctctgtnga aacattttaga aactggattt 300
gggaacccan ttttggaata ccagattcat agtcatgaaa atggaaactt ncatattctg 360
tttttgaaaa gatgtggacc t 381
```

<210> 209

<211> 231

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (83)

<223> n=A,T,C or G

<400> 209

```
gtggagagca agtgatttat taaagcaaga cggtgaaacc tttacattct gcagtgaaga 60
tcagggtgtc attgaaagac agnggaaacc aggatgaaag tttttacatg tcacacacta 120
catttcttca atattttcac caggacttcc gcaatgaggg ttcgtttctg aagggacatc 180
tgatccgtgc atctcttcac tcctaacttg gctgcaacag cttccacctg c 240
```

<210> 210

<211> 371

<212> DNA

<213> Homo sapiens

<400> 210

```
tccatcctgg ttttgcagag atcaggttgt tgacagttcc tggttgaccc acagctaccc 60
atgtcagtta tctccactaa catatccaag aatctttgta ggacaatttc tccacctgca 120
agggttttta ggtagaactc ttcttttaag gcaattagcc cattgccaaa aggttttact 180
gtcttaaacg tgcctttctg agatctaatt ccaaggactt ctccacagct aagtgagatg 240
cctcacacca ttaggtgatg ctttggacag aacagagtat tttcatcttg tgtttaaagc 300
aatccttgg cttcggtctc tcaccacttt ctatgccagt ctcccattta tgccctagt 360
aatgcctatg c 371
```

<210> 211

<211> 471

<212> DNA

<213> Homo sapiens

<400> 211

```
tttattttta aagaaaaaaa ttaaaataga gccacaaat gcaattaaga aaaaaaaagt 60
attgagacac aaggggacct acatgttctg gtctaagaag catgcaagta ttacaaagca 120
ttccagatac agtatgacag aggaacagtg aacaagcatt ggaacgatgc tctttctttc 180
agaaacggga agtctaacag ttatgttttc acaatggtag tgattaaacc atctttattt 240
ttaaggaatt ttataggaag aatttttagc ccatcattaa aggaaaaata ataatacctt 300
tttagccctg cctatctcca gtcttggaat aataacagaa gcatagcacc tttcagtatc 360
taaaatataa acaagaatag taagtccatc ccagcttcta gagatgaggt agctcatgct 420
```

aagaaatggtt gggtcatttt tcctatgaaa gttcaaaggc caaatgggtca c 480

<210> 212

<211> 401

<212> DNA

<213> Homo sapiens

<400> 212

```

tggcctgtct ccttcacata gtccatatca ccacaaatca cacaacaaaa gggagaggat 60
atattttggg ttcaaaaaaa gtaaaaagat aatgtagctg cttttctttg gttattttgg 120
gccccaaaata tttcctcatc tttttgttgt tgtcatggat ggtggtgaca tggacttggt 180
tatagaggac aggtcagctc tctggctcgg tgatctacat tctgaagttg tctgaaaatg 240
tcttcatgat taaattcagc ctaaacgttt tgccgggaac actgcagaga caatgctgtg 300
agtttccaac ctcagcccat ctgcgggcag agaagggtcta gtttgtccat caccattatg 360
atatcaggac tggttacttg gttaaggagg ggtctacctc g 401

```

<210> 213

<211> 461

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(461)

<223> n=A,T,C or G

<400> 213

```

tgtgaagcat acataaataa atgaagtaag ccatactgat ttaatttatt ggatgttatt 60
ttccctaaga cctgaaaatg aacatagtat gctagttatt ttccagtgtt agccttttac 120
tttcctcaca caatttggaa tcatataata taggtacttt gtccctgatt aaataatgtg 180
acggatagaa tgcatacaagt gttttattatg aaaagagtgg aaaagtatat agcttttanc 240
aaaaggtggt tgcccatctt aagaaatgag cgaatatata gaaatagtgn gggcatttct 300
tcctgttagg tggagtgtat gtgttgacat ttctcccat ctcttccac tctgtttnt 360
ccccattatt tgaataaagt gactgctgaa nangactttg aatccttatc cacttaattt 420
aatgtttaaa gaaaaaccta taatgaaaag tgagactcct t 461

```

<210> 214

<211> 181

<212> DNA

<213> Homo sapiens

<400> 214

```

cctgagcttc tactccttcc ccttaagatt cctccaaagc accagctcca taaaatcctt 60
cagctcccca gaccacacc aagaaccca catgttaatt ggatcagcca aatctacaag 120
cagataagtc ctaaggagaa tgccgaagcg tttttcttct tcctcaagcc tagcatgaga 180
c 181

```

<210> 215

<211> 581

<212> DNA

<213> Homo sapiens

<400> 215

```

ctgctttaag aatgggtttc caccttttcc ccctaattct taccaatcag acacatttta 60
ttatttaaat ctgcacctct ctctatttta tttgccaggg gcacgatgtg acatatctgc 120

```

```

agtccagca cagtgggaca aaaagaattt agaccccaaa agtgtcctcg gcatggatct 180
tgaacagaac cagtatctgt catggaactg aacattcatc gatggtctcc atgtattcat 240
ttattcactt gttcattcaa gtatttattg aatacctgcc tcaagctaga gagaaaagag 300
agtgcgcttt ggaaatttat tccagttttc agcctacagc agattatcag ctcggtgact 360
tttctttctg ccaccattta ggtgatggtg tttgattcag agatggctga atttctattc 420
ttagcttatt gtgactgttt cagatctagt ttgggaacag attagaggcc attgtcctct 480
gtcctgatca ggtggcctgg ctgtttcttt ggatccctct gtcccagagc caccagaac 540
cctgactctt gagaatcaag aaaacaccca gaaaggacct c 581

```

<210> 216

<211> 281

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(281)

<223> n=A,T,C or G

<400> 216

```

ccgatgtcct gcttctgtgg accaggggct cctctgnngg tggcctcaac cacggctgag 60
atccctagaa gtccaggagc tgtggggaag agaagcactt agggccagcc agccgggcac 120
cccacttgc gcccgcaccc acgctcacgc accagacctg ccnnggcggt cgctcnaaag 180
ggcgaattct gcagatatcc atcacactgg cggacgctcg agcatgcac tagagggccc 240
aattcacctt atantgagtc gtattacaat tcactggccg t 281

```

<210> 217

<211> 356

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(356)

<223> n=A,T,C or G

<400> 217

```

atagcagggt tcaacaattg tcttgtagtt tgnagtaaaa agacataaga aagagaaggt 60
gtggtttgca gcaatccgta gttggtttct caccataccc tgcagttctg tgagccaaag 120
gtcttgacga aagttaaaat aaatcacaaa gactgctgtc atatattaat tgcataaaca 180
cctcaacatt gctcagagtt tcatccgttt ggttaagaaa acattccttc aattcatcta 240
tggcatttgt agtggcattg tcgtctatga actcttgaag aagttctttg tattcagtct 300
tagacacttg tggattgatt gncttggaaa tcacattctc caataaggga cctcgg 360

```

<210> 218

<211> 321

<212> DNA

<213> Homo sapiens

<400> 218

```

ttgtccatcg ggagaaaggt gtttgtcagt tgtttcataa accagattga ggaggacaaa 60
ctgctctgcc aatttctgga tttctttatt ttcagcaaac actttcttta aagcttgact 120
gtgtgggcac tcatccaagt gatgaataat catcaagggt ttgttgcttg tcttggattt 180
atatagagct tcttcatatg tctgagtcca gatgagttgg tcacccaac ctctggagag 240
ggtctggggc agtttgggtc gagagtcctt tgtgtccttt ttggctccag gtttgactgt 300

```

ggtatctctg gacctgcctg g

321

<210> 219

<211> 271

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (41)

<223> n=A,T,C or G

<400> 219

ccggttaggt ccacgcgggg gcagtggagg cacaggctca nggtggccgg gctacctggc 60  
accctatggc ttacaaagta gagttggccc agtttccttc cacctgaggg gagcactctg 120  
actcctaaca gtcttccttg ccctgccatc atctgggggtg gctggctgtc aagaaaggcc 180  
gggcâtgtt tctaaacaca gccacaggag gctttagagg catcttcag gtggggaaac 240  
agtcttagat aagtaagggt acttgtctaa g 271

<210> 220

<211> 351

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(351)

<223> n=A,T,C or G

<400> 220

gtcctacgac gaggaccagc ttttcttctt cnacttttcc canaacactc gggtgccctg 60  
cctgcccga tttgctgact gggctcagga acagggagat gtcctgccca ttttatttga 120  
caaagagttc tgcgagtggg tgatccagca aatagggcca aaacttgatg ggaaaatccc 180  
gggtgtccaga gggtttcccta tcgctgaagt gtccacgctg aagcccctgg agtttggcaa 240  
gcccacact ttggtctgtt ttgtcagtaa tctcttccca cccatgctga cagtgaactg 300  
gtagcatcat tccgtccctg tgggaaggatt tgggcctact tttgtctcag a 360

<210> 221

<211> 371

<212> DNA

<213> Homo sapiens

<400> 221

gtctgcagaa gcgtgtctga ggtgtccggt ggaggtggca gccgagctct gggactaatc 60  
accgtgctgg ggacggcacc gcgtcaggat gcaggcagat ccctgcagaa gtgtctaaaa 120  
ttcacactcc tcttctggag ggacgtcgat ggtattagga tagaagcacc aggggacccc 180  
acgaacggtg tcgtcgaaac agcagccctt atttgcacac tgggagggcg tgacaccagg 240  
aaaaccacaa ttctgtcttt cacggggggc cactgtacac gtctctgtct gggcctcggc 300  
cagggtgccg agggccagca tggacaccag gaccagggcg cagatcacct tgttctccat 360  
ggtggacctc g 371

<210> 222

<211> 471

<212> DNA

<213> Homo sapiens



&lt;400&gt; 222

```
gtccatgttc catcattaat gttccaacat caccagggac acaaagctgc aaaaatgaga 60
agggaaataa ggtagagaa aggatccggg caatcttaag gactgaggaa gacatgttcc 120
ccaacccttg aactcacaaa ccctgaagct caaggattgc atccttcctc caaatctcac 180
tcaacataat aagtgcagaa caacatgcca aagcactgta tgaagcacta gggacaaaga 240
caagggtcaaa atccttgtaa ccaaatttaa tgggtattgta atgcagtgtt aacacaggac 300
agtaacagaa cacccaagaa ccaaacagaa gagggtaggg ataagcataa atgaagtaac 360
atgaaataaa cttccaaatg gaaaacttgt ccataccccc agggcaagtc aactacagtc 420
tcccaaagga cataaattcc acttagggca cactagacag aaaacaatat t 480
```

&lt;210&gt; 223

&lt;211&gt; 411

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 223

```
agttgctcta caatgacaca caaatcccggt taaataaatt ataaacaagg gtcaattcaa 60
atgtgaagta atgttttagt aaggagagat tagaagacaa caggcatagc aaatgacata 120
agctaccgat taactaatcg gaacatgtaa aacagttaca aaaataaacg aactctcctc 180
ttgtcctaca atgaaagccc tcatgtgcag tagagatgca gtttcatcaa agaacaaaca 240
tccttgcaaa tgggtgtgac gcggttccag atgtggattt ggcaaaacct catttaagta 300
aaaggttagc agagcaaagt gcggtgcttt agctgctgct tgtgccgctg tggcgctcggg 360
gaggctcctg cctgagcttc ctccccagc tttgctgcct gagaggaacc a 420
```

&lt;210&gt; 224

&lt;211&gt; 321

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (31)

&lt;223&gt; n=A,T,C or G

&lt;400&gt; 224

```
ggtctgaagt ttgataacaa agaaatatat ntaagacaaa aatagacaag agttaacaat 60
aaaaacacaa ctatctgttg acataacata tggaaacttt ttgtcagaaa gctacatctt 120
cttaatctga ttgtccaaat cattaaaata tggatgattc agtgccattt tgccagaaat 180
tcgtttggct ggatcataga ttaacatttt cgagagcaaa tccaagccat tttcatccaa 240
gtttttgaca tgggatgcta ggcttcctgg tttccatttg ggaaatgtat tcttatagtc 300
ctgtaaagat tccacttctg g 321
```

&lt;210&gt; 225

&lt;211&gt; 251

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (34)

&lt;223&gt; n=A,T,C or G

&lt;400&gt; 225

```
atgtctgggg aaagagttca ttggcaaaag tgnctccca agaatggttt acaccaagca 60
```

gagaggacat gtcactgaat ggggaaaggg aacccccgta tccacagtca ctgtaagcat 120  
ccagtaggca ggaagatggc tttgggcagt ggctggatga aagcagattt gagataccca 180  
gctccggaac gaggtcatct tctacagggt cttccttcac tgagacaatg aattcagggt 240  
gatcattctc t 251

<210> 226

<211> 331

<212> DNA

<213> Homo sapiens

<220>

<221> unsure

<222> (1)...(331)

<223> n=A,T,C or G

<400> 226

gttaggtccc agggcccccg ccaagnnggt accnnnnntna ccactcctga cccaaaaatc 60  
aggcatggca ttaaaacggt gcaaattcct ttactgttat cccccccacc accaggacca 120  
tgtaggggtgc agtctttact ccctaaccgg tttcccgaaa aagggtgtac ctccctttcca 180  
gacagatgag agagggcagg acttcaggct ggatccacca ctggggtctc cctccccccag 240  
cctggagcac gggagggggag gtgacggctg gtgactgatg gatgggtagt gggctgagaa 300  
gagggggacta ggaaggggcta ttccaggctc a 331

<210> 227

<211> 391

<212> DNA

<213> Homo sapiens

<400> 227

aggtctgccc ttgaagtata ggaaggaatc atagttggag gacttctgca ttatttggtg 60  
gctgaagcta gaagtgaac cccctcctga tttctgcagc aagatgaact gccttatccc 120  
cagcccgagc gaatgttcat atctgagcaa tcaatgggca ctgtgttcaa ccacgccatt 180  
ttcaagattg gctccttaaa ccaccacaa ggcaccagct ctgggagaag ctgcagggag 240  
aagagaacaa agccctcgct gtgatcagga tgggtgtctc ataccttttc tctgggggtca 300  
ttccaggtat gagacagagt tgaacctgcg catgagcgtg gaggccgaca tcaacggcct 360  
gcgcagggtg ctggatgagc tgaccctgga c 391

<210> 228

<211> 391

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (35)

<223> n=A,T,C or G

<400> 228

gttgctcata gccacctcct gggatagaag cttntagtt catagtctga ttagtgtgtc 60  
cttaggacat aggtccagcc ctacagatta gctgggtgaa gaaggcaagt gtctcgacag 120  
ggcttagtct ccacctcag gcatggaacc attcagggtg aagcctggga tgtgggcaca 180  
ggagactcag gctgatataa aaataacaaa atcagtaata aaaaaattat aaaacctgtt 240  
gcttgctcga atagatttga gcaacagtct tgcttttgtt aaaatcctgg agccgttaag 300  
tcctgaatat tcttctggac atcattgctg gctggagaaa ggagccccag gcccggtcgc 360  
gctgacatct gtcagggttg gaagtctcat c 391

<210> 229  
<211> 341  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (202)  
<223> n=A,T,C or G

<400> 229  
gtccatggct tctcaccag acagtctttc tgggcaactt ggggaagccc ctgttctgct 60  
caagtctcac cccatggaag aggtggggga agggggcctt ggtttttcag gaagacgggt 120  
tggagagcac gagtcactac aaagcagtaa aagtgaatgg tgtctccagg ggctgggtcc 180  
agaacaccgc ggagagcccc anccataaag gtgtgttccg cctctggcct gcaggaatct 240  
ctttgaatct ctttgattgg tggctccaag agcaatggga agtcaacagc caggaggctg 300  
gactgggttc cctgggaccc cgaggtccca gaggctgctg g 341

<210> 230  
<211> 511  
<212> DNA  
<213> Homo sapiens

<400> 230  
gtccaagcca aggaaaccat tcccttacag gagacctccc tgtacacaca ggaccgcctg 60  
gggctaaagg aaatggacaa tgcaggacag ctagtgtttc tggctacaga aggggaccat 120  
cttcagttgt ctgaagaatg gttttatgcc cacatcatat cattccttgg atgaaaccgc 180  
tatagttcac aatagagctc agggagcccc taactcttcc aaaccacatg ggagacagtt 240  
tccttcatgc ccaagcctga gctcagatcc agcttgcaac taatccttct atcatctaac 300  
atgccctact tggaaagatc taagatctga atcttatcct ttgccatctt ctgttaccat 360  
atgggtgttg atgcaagttt aattaccatg gagattgttt taaaaacttt tgatgtggtc 420  
aagttcagtt ttagaaaagg gagtctgttc cagatcagtg ccagaactgt gcccaggccc 480  
aaaggagaca actaactaaa gtagtgagat a 511

<210> 231  
<211> 311  
<212> DNA  
<213> Homo sapiens

<400> 231  
ggccaagta agctgtgggc aggcaagccc ttcggtcacc tgttggttac acagaccctt 60  
cccctcgtgt cagctcaggc agctcgaggc ccccgaccaa cacttgaggc ggtccctgct 120  
agttagcgcc ccaccgccgt ggagttcgta ccgcttcctt agaacttcta cagaagccaa 180  
gtcccttggg gccctgttgg cagctctagc tttgcagtcg tgtaattggc ccaagtcatt 240  
gtttttctcg cctcactttc caccaagtgt ctagagtcac gtgagcctcg tgtcatctcc 300  
gggtgggacc t 311

<210> 232  
<211> 351  
<212> DNA  
<213> Homo sapiens

<400> 232  
tcgttttagct aataatccct tccttgatga tacactccaa cttcttgttt ttctttattt 60

ctaaaaagcg gttctgtaac tctcaatcca gagatgttaa aaatgtttct aggcacggta 120  
 ttagtaaate aagtaaattt catgtcctct taaaggacaa acttccagag atttgaatat 180  
 aaatttttat atgtgttatt gattgtcgtg taacaaatgg cccccacaaa ttagtagctt 240  
 aaaatagcat ttatgatgtc actgttttct ttgccttttc attaatgttc tgtacagacc 300  
 tatgtaaaca acttttgat atgcatatag gatagctttt ttgaggggat a 360

<210> 233

<211> 511

<212> DNA

<213> Homo sapiens

<400> 233

aggctctggat gtaaggatgg atgctctcta tacatgctgg gttggggatg ctgggactgc 60  
 acagccaccc ccagtatgcc gctccaggac tctgggacta gggcgccaaa gtgtgcaaat 120  
 gaaaatacag gatacccagg gaactttgaa ttccagattg tgaaaagaaa acaaatcttg 180  
 agactccaca atcaccaagc taaaggaaaa agtcaagctg ggaactgctt agggcaaagc 240  
 tgctctcccat tctattcaca gtcaccccc tgaggctcac ctgcatagct gattgcttcc 300  
 ttccccctat cgcttctgta aaaatgcaga ctactgagc cagactaaat tgtgtgttca 360  
 gtggaaggct gatcaagaac tcaaaagaat gcaacctttt gtctcttacc tactacaacc 420  
 aggaagcccc cacttaaggg ttgtcccacc ttactggact gaaccaaggt acatcttaca 480  
 cctactgatt gatgtctcat gtccccctaa g 511

<210> 234

<211> 221

<212> DNA

<213> Homo sapiens

<400> 234

cagggtccagc gaaggggctt cataggctac accaagcatg tccacataac cgaggaagct 60  
 ctctccatca gcatagcctc cgatgaccat ggtgttccac aaaggggttca tcttcgagcg 120  
 ccggctgtac atggccctgg tcagccatga atgaatagct ctaggactat agctgtgtcc 180  
 atctcccaga agctcctcat caatcaccat ctggccgaga c 221

<210> 235

<211> 381

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (33)

<223> n=A,T,C or G

<400> 235

ggtccaagaa agggacatct atgtgaaagt ganactgaga cagtgtctggt cacaggtcat 60  
 gctgcagaat aatacattcc caggcactgt cacgtggggg acccaagagg cccagaggat 120  
 gacctataac ctctccagaa agaccactct gtgtggcatc acagtccaca cagtttaagg 180  
 aaatatttag acttaacaat cagacaccag ctcttactca cacttacact cacagcccac 240  
 acacaagtgt gcaaacatac acacacatat atatttcctg atacattcat ggaatatcag 300  
 agccctgccc tgaagtcgtt agtgtctctg ctccccaaac cgctgtctcc acattggcta 360  
 agtccctca agagacctca g 381

<210> 236

<211> 441

<212> DNA

<213> Homo sapiens

<400> 236

```
aggtcctggt gccctttct tttgcccaac ttgccattt gggaattgga atatttacc 60
aacacctgta ctgcattgaa tattggaagc aaataacttg gctttgatct tataaggctca 120
cagatggagg aacgtacctt gaagttcaga tgagatttcg gacttttgag ttgatgctga 180
aacagcttga gatttttggg gactactgag agatgataat tgtattgtgc aatatgagaa 240
ggacatgaga tttggtgggc ataggtgtga aatgacattg tttggatgtg tttaccctcc 300
aatctcttg ttgaatgtga tcttaaacgt tgggtggggg cctagtggaa ggtgttgaat 360
catgggggtg gactcttcat aatttgctta gtcctatccc cttggtgatg agcaagtcct 420
tgctctggtg tgcacatga g                                     441
```

<210> 237

<211> 281

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(281)

<223> n=A,T,C or G

<400> 237

```
tcctaaaaaa ttagctgacc ttgttaaaaa tgttggcgtg agcagtatat tattacctat 60
ctttttttat tgtgtgtgtg nggtgtgtgn ttaactaat tggctgaaat atctgcctgt 120
ttccctcttt acatttttct tgtttctttc cttatttatc tttgtccatc ttgagatcta 180
ctgtaaagtg aatnttttaa tgaaaacann nccaagttnt actctcactg ggnrtgggac 240
atcagatgta attgagaggc caacaggtaa gtcttcatgt c                                     281
```

<210> 238

<211> 141

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(141)

<223> n=A,T,C or G

<400> 238

```
gtctgcctcc tcctactggt tccctctatn aaaaagcctc cttggcgag gttccctgag 60
ctgtgggatt ctgcactggt gcttnggatt ccctgatatg ttccttcaaa tccactgaga 120
attaaataaaa catcgctaaa g                                     141
```

<210> 239

<211> 501

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(501)

<223> n=A,T,C or G

<400> 239

```

aacaatctaa acaaatccct cggttctann atacaatgga ttccccatat tggaaggact 60
ctgangcttt attccccac tatgcntatc ttatcatttt attattatac acacatccat 120
cctaaactat actaaagccc ttttcccatg catggatgga aatggaagat ttttttttaa 180
cttgttctag aagtcttaat atgggctgtt gccatgaagg cttgcagaat tgagtcatt 240
ttctagctgc ctttattcac atagtgatgg ggtactaaaa gtactgggtt gactcagaga 300
gtcgtgtgca ttctgtcatt gctgctactc taacactgag caacactctc ccagtggcag 360
atccccgtga tcattccaag aggagcattc atcccccttg tctaataatg aggaatgatg 420
cttattagaa aacaaactgc ttgacccagg aacaagtggc ttagcttaag naaacttggc 480
tttgctcana tccctgatcc t
501

```

&lt;210&gt; 240

&lt;211&gt; 451

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 240

```

tgtcctgaaa ggccattact aatagaaaca cagcctttcc aatcctctgg aacatattct 60
gtctgggttt ttaatgtctg tggaaaaaaa ctaaacaaagt ctctgtctca gtttaagagaa 120
atctattggg ctgaagggtt ctgaacctct ttctgggtct cagcagaagt aactgaagta 180
gatcaggaag gggctgcctc aggaaaattc ctagatccta ggaattcagt gagaccctgg 240
gaaggaccag catgctaata agtgtcagtg aatccacagt ctttacttcc tgcctcataa 300
agggccaggt ctccccagta ccaagtctt tctcatgaa gttgtgttgc ctgaggtgt 360
ttagggacca ttgctgtct tggtcacatg agtctgtctc cttactttag tccctgggca 420
atccttgctt aatgcttttg ttgactcaac g
451

```

&lt;210&gt; 241

&lt;211&gt; 411

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(411)

&lt;223&gt; n=A,T,C or G

&lt;400&gt; 241

```

aatctccagt gtgatggat cggggtaga gcttcaatct ccagtgtgat ggtactgcag 60
cnagagcttc aatctccagt gngatggat tagggtaga tcttcaatct ccagtgtgat 120
ggatcaggg ttagagcttc agcctccagt gtgatggat cagggttaga gcttcagcct 180
ccagtgtgat ggtatcgggg ttagatcttc aatccccagt ggtgggtggt agagcttcaa 240
tctccagtgt gatggattg gggtagagc ttcaatctcc agtctgatg tgtttcgga 300
tggggctttt aagatgtaat tagggtttaa gatcataagg gacctggtct gatggggatt 360
agtncgcttn tatgaagaga cacangaggg cttgctctat ctctgactct c 420

```

&lt;210&gt; 242

&lt;211&gt; 351

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 242

```

ttccccctca caacagtaga gacctacaca gtgaactttg gggacttctg agatcagcgt 60
cctaccaaga cccagccca actcaagcta cagcagcagc acttcccaag cctgctgacc 120
acagtcacat caccatcag cacatggaag gccctggta tggacactga aaggaagggc 180
tggctctgcc cctttgaggg ggtgcaaaca tgactgggac ctaagagcca gaggtgtgt 240
agaggctcct gctccacctg ccagtctcgt aagaaatggg gttgctgcag tgttggagta 300

```

ggggcagagg gagggagcca aggtcactcc aataaaacaa gctcatggca c 360

<210> 243

<211> 241

<212> DNA

<213> Homo sapiens

<400> 243

gtctgtgctt tatcaggaaa agcacaagaa tatgtttttc tacctaaaac cctcttctac 60  
tttaaaaatg gtttgctgaa tttttctatg tttttaaaat gtttttatgc ttttttttaa 120  
acacgtaaag gatggaacct aatcctctcc cgagacgcct cctttgtgtt aatgcctatt 180  
cttacaacag agaaacaagt acattaatat aaaaacgagt tgattattgg ggtataaaat 240  
a 241

<210> 244

<211> 301

<212> DNA

<213> Homo sapiens

<400> 244

ggtccagagc aatagcgtct gtggtgaagc gcctgcactc ctcgaggagac atgcctggct 60  
tatatgctgc atccacataa ccatagataa aggtgctgcc ggagccacca atggcaaaaag 120  
gctgtcgagt cagcattcct cccaggggtc catatacctg acctccttca cgttggtccc 180  
agccagctac catgagatgt gcagacaagt cctctcgata tttatagctg atattttctca 240  
ccacatttgc agcagccaaa acaagtggag gtctctccag ttctatccca tggagctcca 300  
g 301

<210> 245

<211> 391

<212> DNA

<213> Homo sapiens

<400> 245

ctgacactgc tgatgtgggc cggggggcgc cgaggcacia ctggtggccg gaccattgag 60  
gcacctggag ggtaggcagc ttgtggtgca gacaccacag agagagaaaa gttggatgga 120  
gtggtgggaa taatcagggt ggcacactgt gcctagaagc ttccagggcc accaagagaa 180  
tgggaaggga aactacaaca ttcacaacag aaataggagt caattcactt agaccagaa 240  
ctccagaaag ggggagtgtg ggaatctaca atttcaaagc cagctcgtgt ctacctagag 300  
ccccaaactg cataagcacc aggattgtac accttagtcc ctcaagatag tttcaagtga 360  
gcgtgcaatt cactcttaca gaggagggcc t 391

<210> 246

<211> 291

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(291)

<223> n=A,T,C or G

<400> 246

tcctccacag ggggaagcagg aagttngacc agcttcaggc tggaacgtgc ccagggcaca 60  
gagctggcaa ggtgcaaagn cntctgcaga atattcacca ggttgacaca gacctccaca 120  
ttcagacata ttccaagctt ctggggctct caggggccca gaatttcctg gtcttgggca 180

tggtnccacaa gtcatttgtc cttcctcatt ttggaagggt ccatttggac ataaaatgca 240  
agcgttctcg tgcctncatna taatagggtcc cagcctgcac tgacacattt g 300

<210> 247

<211> 471

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(471)

<223> n=A,T,C or G

<400> 247

cactgagtga atgagtatat aatttatgaa aacagaaaag tgctttggaa aaaaaaaaaag 60  
acaacaggag tacatacagn gaacaaaaaa gagtgtacca ggaggagcan accctgaaca 120  
gttanaacta tggaaatcgc tatgctttgt gttgtcacag gaggtaaaat aggaataccc 180  
tgcatacaat aaatatttat tggataaata actaagcctg ataccctttt caatgctgta 240  
tacanactnt atcatcacac cactaatcta agttctcana agttaaacat tacaagactt 300  
cagaacaaca taggcgtntt tggctccatt taacanaana aggaccatag tgatcattta 360  
atctctatga gtctgtctta tcttctggaa aaggggccta acaccatttc cttttgcaaa 420  
aaggtagctg ccttgcttcc agttctacca tcctntagca acccatcttt n 480

<210> 248

<211> 551

<212> DNA

<213> Homo sapiens

<400> 248

ccatgggagc aggaatgggg tcaggtcagt tgacctgagc ataccatta aacatgttca 60  
aatgtcccca tcccaccac tcacatgaca tggctccga gccctgagat ctgtatccca 120  
agaacctcag ttgagaaata tttatggcag cttcactgtt gctcaagagc ctgggtattg 180  
tagcagcctg ggggcagggt gtccctaatt ttctccaagt tcttcacatc agccagaatc 240  
ccatctatgc ttgtctccag caaatggagg tggccctct gctgacgtgc cctctcttcc 300  
agctctgaca tcatgggccg cagttggctg ttgatctggg tcttggctcg ggaaagcttc 360  
tgctccagta agaccagccc ctcttcatct acactgagag gctggtccat cagatgcagg 420  
aggcgtctta atgtgttgag tgtgtcttgg attgtaaccc cagcgttctt ggctctggta 480  
tcaaccttct gggcttctgt aatcaccatc tgtactgcat ccatattcgt gtcgaactcc 540  
agctccttcc t 551

<210> 249

<211> 181

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(181)

<223> n=A,T,C or G

<400> 249

atntccagag ggaccgtaag actggtacaa gtttacacca taagaggcga cgtggtcagc 60  
cacaatgtct tcacctccac aggggctcat cacgnggtc agggcaaggg ccccagcat 120  
cagagctttg tttaggatca tcctcttccc aaggcagcct tagcagttgc tgacctgccc 180  
g 181



77.

<210> 250  
<211> 551  
<212> DNA  
<213> Homo sapiens

<400> 250  
tctgtagcta ggatgagctg gctctcaagc aaaagtttgt cttcctgggt ccatttgtgg 60  
ttatcacttg ttattgaatg tacatcacaa attaaagtct gcattgttgg acgtaagaga 120  
atgtgccgac ttgggtaacc aggagatttc atgttactgg actgcctgta gtcacgtatt 180  
tctgctatga cacatccgca atgaaaaata ttaacctgag atttttctag gagatcaacc 240  
aaaataggag gtaattcttc tgcattccaa tattcaagca actctccttc ttcataagggc 300  
agtcgaatgg tctcggaatc tgatccggtt tttcccctga gcatcagaga atatccctca 360  
tttcctgggt atagattgac cactaaacat gacaaagtct cttgcataac aagcttctct 420  
aacaagttca catttcttct taatttctta acttcagggt ctttttcaca ttcttcaata 480  
tacaagtcac aaagttttg aaatacagat tttcttccac ttgataggta tttcctttta 540  
ggaggtctct g 551

<210> 251  
<211> 441  
<212> DNA  
<213> Homo sapiens

<400> 251  
tgtctgctct cccatcctgg ttactatgag tcgctcttgg cagaaaggac cacagatgga 60  
gagcttgga ctcgctccaa ctttgccgaa aagaggacaa ccaccaaagt agtaggtaaa 120  
aacacaattt tagcagcagt gaaataaaaa gaggaagtga ggatggggcc aggccgcaac 180  
tataattaaa ctgtctgttt aggagaagct gaatccagaa gaaacacaag ctgtaaaagt 240  
agagaggaca gggagcaggg cctttggaga gcaggagagg acaggctgtc accaagcgct 300  
gctcggactc tgccctgaaa gatttgaatt ggacactgtc cagtacgtg tgtggcaaac 360  
cgtactccaa gcacttttct cacggcagag gaaggagctg ccatggctgt acccctgaac 420  
gtttgtgggg ccagcgatgt g 441

<210> 252  
<211> 406  
<212> DNA  
<213> Homo sapiens

<400> 252  
ttttttttt aacaagtaaa aatttcttta tttgctgaca ataagataac ctacagggaa 60  
aacctgatga aatctattaa aaagtacta aaactaataa aagaatttag gaaggttata 120  
gaatgtaaga ccaagacaca aaaatcaatt acatttctat ataatagcaa tgaacagata 180  
ctgaaatttt aaaaactaaa tcattttaca aaagtatcac aatatgaaac actccgggat 240  
aaattggata aaagatgtgc aagactgtac aaaagctaca aaacatttat gaaggaaatt 300  
ggaagataga aacaagatag aaaatgaaaa tattgtcaag agtttcagat agaaaatgaa 360  
aaacaagcta agacaagtat tggagaagta tagaagatag aaaaat 406

<210> 253  
<211> 544  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (224)

<223> n=A,T,C or G

<400> 253

```
gaaggagttc agtagcaaag tcacacctgt ccaattccct gagctttgct cactcagcta 60
atgggatggc aaaggtggtg gtgctttcat cttcaggcag aagcctctgc ccatccccct 120
caagggctgc aggccagtt ctcatgctgc ccttgggtgg gcatctgtta acagaggaga 180
acgtctgggt ggcggcagca gctttgctct gagtgcctac aaanctaag cttgggtgcta 240
gaaacatcat cattattaaa cttcagaaaa gcagcagcca tgttcagtca ggctcatgct 300
gcctcactgc ttaagtgcct gcaggagccg cctgccaaag tccccctcct acacctggca 360
cactggggtc tgcacaaggc tttgtcaacc aaagacagct tccccctttt gattgcctgt 420
agactttgga gccaaagaaac actctgtgtg actctacaca cacttcaggt ggtttgtgct 480
tcaaagtcac tgatgcaact tgaaaggaaa cagttaaatg gtggaaatga actaccattt 540
ataa 544
```

<210> 254

<211> 339

<212> DNA

<213> Homo sapiens

<400> 254

```
tggcattcag ggcagtgtct tctgcatctc ctaggaacct cgggagcggc agctccggcg 60
cctggtagcg agaggcgggt tccggagatc ccggcctcac ttcgtccac tgtggttagg 120
ggtgagtcct gcaaagtgtta agtgatttgc tcaaggtgcc catttcgcag gaattggagc 180
ccaggccagt tctctgagcc tatcattagg gctaaaggag tgcgtgatca gaatgggtgtc 240
tggacgggtc tacttgtcct gcctgctgct ggggtccctg ggtctatgt gcatcctctt 300
cactatctac tggatgcagt actggcgtgg tggctttgc 339
```

<210> 255

<211> 405

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(405)

<223> n=A,T,C or G

<400> 255

```
gaggtttttt nttttttttt tttttttttt caattaaana tttgatttat tcaagtatgt 60
gaaaacattn tacaatggaa acttttntta aatgctgcat gtncgtgtgt atggaccacn 120
cacatacagc catgctgttt caaaaaactt gaaatgccat tgatagttaa aaaactntac 180
nccccgatgga aaatcgagga aaacaattta atgtttcatn tgaatccana ggngcatcaa 240
attaaatgac agctccactt ggcaataaat agctgttact tgatggtatc caaaaaaaaa 300
tggttggggg tgataaaatt caaaaatgct tccccaaagg ngggnggttt ttaaaaagtt 360
tcaggncaca acccttgcan aaaacactga tgcccaacac antga 405
```

<210> 256

<211> 209

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (6)

<223> n=A,T,C or G

&lt;400&gt; 256

```
gggcangtct ggtcctctcc ccacatgtca cactctcctc agcctctccc ccaaccctgc 60
tctccctcct cccctgccct agcccaggga cagagctctag gaggagcctg gggcagagct 120
ggaggcagga agagagcact ggacagacag ctatggtttg gattggggaa gaggttagga 180
agtaggttct taaagaccct tttttagta 209
```

&lt;210&gt; 257

&lt;211&gt; 343

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(343)

&lt;223&gt; n=A,T,C or G

&lt;400&gt; 257

```
tctggacacc ataatccctt ttaagtggct ggatggtcac acctctccca ttgacaagct 60
gggttaagtc aataggttga ctaggatcaa cagcaccxaa atcaataaga tactgcagtc 120
tattgagact caaaggetta tactggcgtc tgaaactatg tccttcgtta aaccctgatt 180
ttgggattcg gatgtaaaat ggagtctggc ctccctcaaa gcccaagcgg ggccgggttc 240
ctctttgcct ttctccttta tggcctctgc cacattttct acctcttctc cgacctcttg 300
gtcttntctc nggtttcttg gagccgggat tcggctttaa gtn 343
```

&lt;210&gt; 258

&lt;211&gt; 519

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 258

```
gcggcttctg acttctagaa gactaaggct ggtctgtggt tgcttggttg cccacctttg 60
gctgataccc agagaacctg ggcacttgct gcctgatgcc caccctgcc agtcattcct 120
ccattcacc cagcgggaggt gggatgtgag acagcccaca ttggaaaatc cagaaaaccg 180
ggaacaggga tttgcccttc acaattctac tccccagatc ctctcccctg gacacaggag 240
acccacaggg caggacccta agatctgggg aaaggagggt ctgagaacct tgaggtagcc 300
ttagatcctt ttctaccac tttcctatgg aggattccaa gtcaccactt ctctcaccgg 360
cttctaccag ggtccaggac taaggcgttt tctccatagc ctcaacattt tgggaatctt 420
cccttaata caacctgtcc tcctgggtgc ctggaagatg gactggcaga gacctctttg 480
ttgcgttttg tgctttgatg ccaggaatgc cgcctagtt 519
```

&lt;210&gt; 259

&lt;211&gt; 371

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 259

```
attgtcaact atatacacag tagtgaggaa taaaatgcac acaaaacaat ggatagaata 60
tgaaaatgtc ttctaaatat gaccagtcta gcatagaacc ttcttctctt ccttctcagg 120
tcttccagct ccatgtcatc taaccactt aacaaacgtg gacgtatcgc ttccagaggc 180
cgtcttaaca actccatttc caaaagtcac ctccagaaga catgtatttt ctatgatttc 240
ttttaaacia atgagaattt acaagatgtg taactttcta actctatttt atcatagtc 300
ggcaacctct ttccatctag aagggtctaga tgtgacaaat gttttctatt aaaagggttg 360
ggtggagttg a 371
```

<210> 260  
<211> 430  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(430)  
<223> n=A,T,C or G

<400> 260  
ttggattttt tgacttgcca tttcagtttt tttaacttttt tttttttttt ttttganaaa 60  
tactatattt attgtcaaag agtggtagat aggtgagtg tcatcttccc tctcatgccg 120  
gtatactctg cttecgctgt tcaagtaaaag ttttccgtag ttctgaacgt cccttgacca 180  
caccataana caagcgcaag tcaactcanaa ttgccactgg aaaactggct caactatcat 240  
ttgaggaaaag actganaaag cctatcccaa agtaatggac atgcaccaac atcgcggtac 300  
ctacatgttc ccgtttttct gccaatctac ctgtgtttcc aagataaatt accaccagg 360  
gagtcacttc ctgctatgtg aacaaaaacc cggtttcttt ctggagggtgc ttgactactc 420  
tctcngnagc 430

<210> 261  
<211> 365  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (178)  
<223> n=A,T,C or G

<400> 261  
tccctgacgat agccatggct gtaccactta actatgatc tattccaact gttcagaatc 60  
atatcacaaa atgacttgta cacagtagtt tacaacgact cccaagagag gaaaaaaaaa 120  
aaaaaagacg cctcaaaatt cactcaactt ttgagacagc aatggcaata ggcagcanag 180  
aagctatgct gcaactgagg gcacatatca ttgaagatgt cacaggagtt taagagacag 240  
gctggaaaaa atctcactat aagcaaacag tagtatctca taccaagcaa aaccaagtag 300  
tatctgctca gcctgccgct aacagatctc acaatcacca actgtgcttt aggactgtca 360  
ccaaa 365

<210> 262  
<211> 500  
<212> DNA  
<213> Homo sapiens

<400> 262  
cctagatgtc atttgggacc cttcacaacc attttgaagc cctgtttgag tccctgggat 60  
atgtgagctg tttctatgca taatggatat tcgggggttaa caacagtccc ctgcttggct 120  
tctattctga atccttttct ttcaccatgg ggtgcctgaa ggggtggctga tgcataatgt 180  
acaatggcac ccagtgtaaa gcagctacaa ttaggagtggt atgtgttctg tagcattccta 240  
tttaaataag cctattttat cctttggccc gtcaactctg ttatctgctg cttgtactgg 300  
tgctgtact tttctgactc tcattgacca tattccacga ccatgggtgt catccattac 360  
ttgatcctac tttcatgtc tagtctgtgt ggttgggtgt gaataggctt ctttttacat 420  
gggtgtgcca gccagctaa ttaatgggtgc acgtggactt ttagcaagcg ggctcactgg 480  
aagagactga acctggcatg 500

81

<210> 263  
<211> 413  
<212> DNA  
<213> Homo sapiens

<400> 263  
ctcagagagg ttgaaagatt tgcctacgaa agggacagtg atgaagctaa gctctagatc 60  
caggatgtct gacttcaaat tgaaactccc aaagtaatga gtttggaagg gtggggtgtg 120  
gcctttccag gatgggggtc ttttctgctc ccagcggata gtgaaacccc tgtctgcacc 180  
tgggtgggcg tgttgctttc ccaaagggtt ttttttagg tccgtcgctg tcttgtggat 240  
taggcattat tatctttact ttgtctccaa ataacctgga gaatggagag agtagtgacc 300  
agctcagggc cacagtgcga tgaggaccat cttctcacct ctctaaatgc aggaagaaac 360  
gcagagtaac gtggaagtgg tccacaccta ccgccagcac attgtgaatg aca 420

<210> 264  
<211> 524  
<212> DNA  
<213> Homo sapiens

<400> 264  
tccaatgggg ccctgagagc tgtgacagga actcacactc tggcactggc agcaaaacac 60  
cattccaccc cactcatcgt ctgtgcacct atgttcaaac tttctccaca gttccccaat 120  
gaagaagact catttcataa gtttgtggct cctgaagaag tcctgccatt cacagaaggg 180  
gacattcttg agaaggtcag cgtgcattgc cctgtgtttg actacgttcc ccagagctc 240  
attaccctct ttatctccaa cattgggtggg aatgcacctt cctacatcta ccgcctgatg 300  
agtgaactct accatcctga tgatcatgtt ttatgaccga ccacacgtgt cctaagcaga 360  
ttgcttaggc agatacagaa tgaagaggag acttgagtgt tgctgctgaa gcacatcctt 420  
gcaatgtggg agtgcacagg agtccaccta aaaaaaaaaa tccttgatac tgttgccctgc 480  
cttttttagtc accccgtaac aagggcacac atccaggact gtgt 524

<210> 265  
<211> 344  
<212> DNA  
<213> Homo sapiens

<400> 265  
tcctttcttc tacttcagga gatgattcaa agttacttgt ggacatttct ttaagttctg 60  
aagacaaatg agacaggatt tggcctgcgg gttcttcaga cttctctacc acctccatta 120  
actcttcac ttggcttgac gtaggcaatg cactattttg ctcttttgtt tctggagatg 180  
acctcagcacc acttctttct cttggcgggg ttctaagtgt gtctttgaat accagtgaag 240  
actcaggcct atcctgtact ggaaaaggac taaatttgtc tttctgtcta ggaggtgatg 300  
cagtagcatc ctctgaggg ggtaaggcca ttttctcttt ttga 344

<210> 266  
<211> 210  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (78)  
<223> n=A,T,C or G

<400> 266  
ccacaatgtc cataacttga gcaggctttg gcatcccacc acccccttca gaccaatata 60

82

cactatgttg gaggaacnac tttaaaatgt aaaatgagaa atgggcactg aacactccat 120  
cctcactccc aacagcccac ccacacacct cttcaactgc tatccaaaca tggaggagct 180  
cttgtggaag agaggctcaa caccaaataa 210

&lt;210&gt; 267

&lt;211&gt; 238

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(238)

&lt;400&gt; 267

tcggnccctcc caccctctna ctgaaattct ntgaaattct cccctttggg atgaggatgg 60  
caaccccagg catgtaccct cccaacctgg gacccgacct aataccctaa catcctgctg 120  
acagtggctg ttctcgctgg gcaggcgctc caaagcacat cgagccagat tcaggcagag 180  
tggaactggc ccctcagcca tcagtggagg tggcctggga ggctctaccc tgaacggg 240

&lt;210&gt; 268

&lt;211&gt; 461

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (459)

&lt;223&gt; n=A,T,C or G

&lt;400&gt; 268

tcctcaagga catgcccctt gatagaaact cagttcctgt ctccagttcc ctccctggacc 60  
tgatccccc aatgcagggc ctgggactat atccagttcc ttattttcag aggcccatgc 120  
acaagatgca cagcaaataa gtgctgaata aagaccagc tactgctagc ttaccctgct 180  
ccaaacattc accaagtcct cagcaaagag ggccatccat tcacctctc taaaaacaca 240  
ctgagctccc cagtctatac cccaagatat gcttggctcc caactatccc tcctctctca 300  
tctccaagcc agtttcccct ttctaagtat actgatatta ccaaagacac tgacaatctt 360  
cttttcctac ctctccccag tgactagggt tgcagcagga gctctataag tcctagtata 420  
cagcagaagc tccataaatg tgtgctgacc taacattang c 461

&lt;210&gt; 269

&lt;211&gt; 434

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 269

ctgtgttggt gagcaccgat tcccactcaa tatggcgtgg cttacagtct tcattaggtt 60  
cccgtcцца accagaatga ggaatgatca cttcatctgt caaggcatgc agtgcattgt 120  
ccacaatctc cattttgatt gagtcatggg atgaaagatt ccacagggtt ccggtaataa 180  
cttcagtaag gtccatatca cgagcctttc gaagcaatcg cacaagggca ggcacaccat 240  
cacagttttt tatggcaatc ttgttatcct ggtcacgtcc aaaagagata ttcttgagag 300  
ctccacaggc tccaaggtgc acttcctttt tgggatgggc taacaatccc accagtactg 360  
ggatgccctt gagcttcggc acgtcagctc tcacctgtc attgcggtag cataagtgtt 420  
gcagggtatgc aaga 434

&lt;210&gt; 270

<211> 156  
<212> DNA  
<213> Homo sapiens

<400> 270  
ctgcaccagc gattaccagt ggcattcaaa tactgtgtga ctaaggattt tgtatgctcc 60  
ccagtagaac cagaatcaga caggtatgag ctagtcaaca gcaagtcttt gttggattcg 120  
agtaggctca ggatctgctg aaggctcggag gagtta 156

<210> 271  
<211> 533  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(533)  
<223> n=A,T,C or G

<400> 271  
ccactgtcac ggtctgtctg acacttactg ccaaacgcat ggcaaggaaa aactgcttag 60  
tgaagaactt agaagctgtg gagaccttgg ggtccacgtn caccatctgc tctgataaaa 120  
ctggaactct gactcanaac cggatgacag tggccacat gtggtttgac aatcaaatcc 180  
atgaagctga tacgacagag aatcagagtg gtgtctcttt tgacaagact tcagctacct 240  
ggcttgctct gtccagaatt gcaggtcttt gtaacagggc agtggttcag gctaaccagg 300  
aaaacctacc tattcttaag cgggcagttg caggagatgc ctctgagtc gactcttaa 360  
agtgcataga gctgtgctgt ggntncgtga aggagatgag agaaagatac nccaaaatcg 420  
tcgagatacc cttcaactcc accaacaagt accagttgtc tattcataag aacccaaca 480  
catcggagcc ccaacacctg ttggtgatga agggcgcccc agaaaggatc cta 540

<210> 272  
<211> 630  
<212> DNA  
<213> Homo sapiens

<400> 272  
tggatatttt ctttttcttt tggatgtttt atactttttt ttcttttttc ttctctattc 60  
ttttcttcgc cttcccgtac ttctgtcttc cagttttcca cttcaaactt ctatcttctc 120  
caaattgttt catcctacca ctcccaatta atctttccat ttctgtctgc gtttagtaaa 180  
tgcgttaact aggtcttaaa tgacgcaatt ctccctgcgt catggatttc aaggctcttt 240  
aatcaccttc ggtttaatct ctttttaaaa gatcgcttc aaattatttt aatcacctac 300  
aacttttaaa ctaaacttta agctgtttta gtcaccttca ttttaattct aaagcattgc 360  
ccttctattg gtattaattc ggggctctgt agtcctttct ctcaattttc ttttaataac 420  
attttttact ccatgaagaa gcttcatctc aacctccgtc atgtttttaga aaccttttat 480  
cttttccttc ctcatgtac tcttctaagt cttcatattt tctcttaaaa tcttaagcta 540  
ttaaaattac gttaaaaact taacgctaag caatatctta gtaacctatt gactatattt 600  
ttaagtagt tgtattaatc tctatctttc 630

<210> 273  
<211> 400  
<212> DNA  
<213> Homo sapiens

<400> 273  
tctggtttgc cctccagttc attctgaatc tagacttgct cagcctaatac aagttcctgt 60

```

acaaccagaa gcgacacagg ttcctttggt atcatccaca agtgaggggt acacagcatc 120
tcaacccttg taccagcctt ctcatgctac agagcaacga ccacagaagg aaccaattga 180
tcagattcag gcaacaatct ctttaataac agaccagact acagcatcat catcccttcc 240
tgctgcgtct cagcctcaag tatttcaggc tgggacaagc aaacctttac atagcagtgg 300
aatcaatgta aatgcagctc cattccaatc catgcaaagc gtgttcaata tgaatgcccc 360
agttcctcct gttaatgaac cagaaacttt aaaacagcaa 400

```

```

<210> 274
<211> 351
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (2)
<223> n=A,T,C or G

```

```

<400> 274
tntgagtatg tcccagagaa ggtgaagaaa gcggaaaaga aattagaaga gaatccatat 60
gaccttgatg cttggagcat tctcattcga gaggcacaga atcaacctat agacaaagca 120
cggaagactt atgaacgcct tggtgcccag tccccagatt ctggcagatt ctggaaactg 180
tacattgaag cagaggttac tatttttattt tattttttct tatatcagta ttgcagcatt 240
cactgtagtg atagaaaaca agttaggaac atagccaatt aggacaagga ggattttaa 300
gtgtcttacc tttattttgt aaaataggta taaaggagta attaaaatga a 360

```

```

<210> 275
<211> 381
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(381)
<223> n=A,T,C or G

```

```

<400> 275
gcgnggtcgc nnncgaggtc tgagaagccc ataccactat ttgttgagaa atgtgtggaa 60
tttattgaag atacaggggt atgtaccgaa ggactctacc gtgtcagcgg gaataaaact 120
gaccaagaca atattcaaaa gcagtttgat caagatcata atatcaatct agtgtcaatg 180
gaagtaacag taaatgctgt agctggagcc cttaaagctt tctttgcaga tctgccagat 240
cctttaattc catattctct tcatccagaa ctattggaag cagcaaaaat cccggataaa 300
acagaacgtc ttcatgcctt gaaagaaatt gttaagaaat ttcacctgt aaactatgat 360
gtattcagat acgtgataac a 381

```

```

<210> 276
<211> 390
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (5)
<223> n=A,T,C or G

```

```

<400> 276

```



gctcngactc cggcgggacc tgctcggagg aatggcgccg cggggttcaa gcaactgtctt 60  
cctgttggcc ctgacaatca tagccagcac ctgggctctg acgcccactc actacctcac 120  
caagcatgac gtggagagac taaaagcctc gctggatcgc ctttcacaa atttggaatc 180  
tgccttctac tccatcgtgg gactcagcag ccttggtgct caggtgccag atgcaaagaa 240  
agcatgtacc taccatcagat ctaaccttga tcccagcaat gtggattccc tcttctacgc 300  
tgcccaggcc agccaggccc tctcaggatg tgagatctct atttcaaag agaccaaaga 360  
tctgcttctg gcagacctcg gccgcgacca 390

<210> 277

<211> 378

<212> DNA

<213> Homo sapiens

<400> 277

tgggaacttc tggggtagga cgttgtctgc tatctccagt tccacagacc caaccagtta 60  
cgatgggttt ggaccattta tgccgggatt cgacatcatt ccctataatg atctgcccgc 120  
actggagcgt gctcttcagg atccaaatgt ggctgcgttc atggtagaac caattcaggg 180  
tgaagcaggc gttgtgtgtc cggatccagg ttacctaatg ggagtgcgag agctctgcac 240  
caggcaccag gttctcttta ttgctgatga aatacagaca ggattggcca gaactggtag 300  
atggctggct gttgattatg aaaatgtcag acctgatata gtcctccttg gaaaggccct 360  
ttctgggggc ttataccc 378

<210> 278

<211> 366

<212> DNA

<213> Homo sapiens

<400> 278

ggagggcaca ttccttttca cctcagagtc ggtcggggaa ggccaccag ataagatttg 60  
tgaccaaaacc agtgatgctg tccttgatgc ccaccttcag caggatcctg atgccaaagt 120  
agcttgtgaa actgttgcta aaactggaat gatccttctt gctggggaaa ttacatccag 180  
agctgtggt gactaccaga aagtgggtcg tgaagctgtt aaacacattg gatatgatga 240  
ttcttccaaa ggttttgact acaagacttg taacgtgctg gtagccttg agcaacagtc 300  
accagatatt gctcaagggtg ttcattctga cagaaatgaa gaagacattg gtgctggaga 360  
ccaggg 366

<210> 279

<211> 435

<212> DNA

<213> Homo sapiens

<400> 279

cctaagaact gagacttgtg acacaaggcc aacgacctaa gattagccca gggttgtagc 60  
tggaagacct acaacccaag gatggaaggc ccctgtcaca aagcctacct agatggatag 120  
aggacccaag cgaaaaagat atctcaagac taacggcccg aatctggagg cccatgaccc 180  
agaacccagg aaggatagaa gcttgaagac ctggggaaat cccaagatga gaaccctaaa 240  
ccctacctct tttctattgt ttacacttct tactcttaga tatttccagt tctcctgttt 300  
atctttaagc ctgattcttt tgagatgtac tttttgatgt tgccggttac cttagattg 360  
acaagtatta tgccctggcca gtcttgagcc agctttaaat cacagctttt acctatttgt 420  
taggctatag tgttt 435

<210> 280

<211> 435

<212> DNA

<213> Homo sapiens

&lt;400&gt; 280

```
tctggatgag ctgctaactg agcacaggat gacctgggac ccagcccagc ccccccgaga 60
cctgactgag gccttcctgg caaagaagga gaaggccaag gggagccctg agagcagctt 120
caatgatgag aacctgcgca tagtggtggg taacctgttc cttgccggga tggtgaccac 180
ctcgaccacg ctggcctggg gcctcctgct catgatccta cacctggatg tgcagcgtga 240
gcccagacct gtccggggcg ccgctcgaaa ttccagcaca ctggcgggcg ttactagtgg 300
atccgagctc ggtaccaagc ttggcgtaat catggtcata gctgtttcct gtgtgaaatt 360
gttatccgct cacaattcca cacaacatac gagccggaag cataaagtgt aaagcctggg 420
gtgcctaatag agtga 435
```

&lt;210&gt; 281

&lt;211&gt; 440

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 281

```
catctgatct ataaatgcgg tggcatcgac aaaagaacca ttgaaaaatt tgagaaggag 60
gctgctgaga tgggaaaggg ctccctcaag tatgcctggg tcttggataa actgaaagct 120
gagcgtgaac gtggtatcac cattgatatc tccttgtgga aatttgagac cagcaagtac 180
tatgtgacta tcattgatgc cccaggacac agagacttta tcaaaaacat gattacaggg 240
acatctcagg ctgactgtgc tgtcctgatt gttgctgctg gtgttggtga atttgaagct 300
ggtatctcca agaatgggca gacccgagag catgcccttc tggcttacac actgggtgtg 360
aaacaactaa ttgtcgggtg taacaaaatg gattccactg agccccctac agccagaaga 420
gatatgagga aattgttaag 440
```

&lt;210&gt; 282

&lt;211&gt; 502

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 282

```
tctgtggcgc aggagcccc tccccggca gctctgacgt ctccaccgca gggactggtg 60
cttctcggag ctccactcc tcagactccg gtggaagtga cgtggacctg gatccactg 120
atggcaagct cttccccagc gatggttttc gtgactgcaa gaagggggat cccaagcacg 180
ggaagcggaa acgaggcccg ccccgaaagc tgagcaaaga gtactgggac tgtctcgagg 240
gcaagaagag caagcacgcg cccagaggca cccacctgtg ggagttcatc cgggacatcc 300
tcatccaccc ggagctcaac gagggcctca tgaagtggga gaatcggcat gaaggcgtct 360
tcaagttcct gcgctccgag gctgtggccc aactatgggg ccaaaagaaa aagaacagca 420
acatgaccta cgagaagctg agccgggcca tgaggtacta ctacaaacgg gagatcctgg 480
aacgggtgga tggccggcga ct 502
```

&lt;210&gt; 283

&lt;211&gt; 433

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(433)

&lt;223&gt; n=A,T,C or G

&lt;400&gt; 283

```
ccatattaga ttactggaac atctaagcat cagtgtgtga ccatgcgaac aaaagacttc 60
ggggagtgtc tttttttaa aaggtttatg tgtgtcgagg cagttgtaaa agatttactg 120
```

87

```

cagaatcaan cccactttta ggcttangac caggttctaa ctatctaaaa atattgactg 180
ataacaaaaa gtgttctaaa tgtggctatt ctgatccata nttgnttttt aaagaaaaaa 240
antgtntata cagaaagagt ntaaaagtgc tgtgaattna atgcaaatta gncnccantc 300
ttgacttccc aaanacttga ttnatacctt tnaactcctnt cnnttcctgn ncttcnttaa 360
nntcaatnat tnggnagtnn anggcctncn gnanaacacc nttncncgnt ccncgcaatc 420
canccgcctt nan 433

```

&lt;210&gt; 284

&lt;211&gt; 479

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 284

```

tctggaagga tcagggatct gagcaaagcc aagtttactt aagctaagcc acttggttct 60
gggtcaagca gtttgttttc taataagcat cattcctgat cattagagca aagggatgaa 120
tgctcctctt ggaatgatac aggggatctg ccactgggag agtggtgctc agtggttagag 180
tagcagcaat gacagaatga cagcgactct ctgagtcaac ccagtacttt tagtaccctg 240
tcactatgtg aataaaggca gctagaaaat ggactcaatt ctgcaagcct tcatggcaac 300
agcccatatt aagacttcta gaacaagtta aaaaaaaatc ttccatttcc atccatgcat 360
gggaaaaggg ctttagtata gtttaggatg gatgtgtgta taataataaa atgataagat 420
atgcatagtg ggggaataaa gcctcagagt ccttcagta tggggaatcc attgtatct 480

```

&lt;210&gt; 285

&lt;211&gt; 435

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(435)

&lt;223&gt; n=A,T,C or G

&lt;400&gt; 285

```

tttttttttt tttttttttt tcaatanaaa tgccataatt tattccattg tataaaaaag 60
tcacccctat gtaacaaaat gtnttcttan aanaanaaat atattatttc aggtcataaa 120
taatcagcaa acatacaact gttggcaact aaaaaaaac ccaacactgg tattttccat 180
cagnctgaa acaaaacctg cttaaanata tatttacagg gatagtncag tntctaaaaa 240
caaaaattga ggtatttttg ttcttctagg agtagacaat gacatttttg gangggcaga 300
cccctnnccc aaaaaataaa ataagggnat nttcttcant atngaanann gggggcgccc 360
cgggggaaan naaaccttgg gnnngggggtt tggcccaagc ccttgaaaaa aaantttntt 420
tcccaaaaaa aacng 435

```

&lt;210&gt; 286

&lt;211&gt; 301

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 286

```

cctggtttct ggtggcctct atgaatccca tgtaggggtgc agaccgtact ccacccctcc 60
ctgtgagcac cagtcacacg gctcccggcc cccatgcacg ggggagggag atacccccaa 120
gtgtagcaag atctgtgagc ctggctacag cccgacctac aaacaggaca agcactacgg 180
atacaattcc tacagcgtct ccaatagcga gaaggacatc atggccgaga tctacaaaaa 240
cggccccgtg gagggagctt tctctgtgta ttccgacttc ctgctctaca agtcaggagt 300
g 301

```

<210> 287  
<211> 432  
<212> DNA  
<213> Homo sapiens

<400> 287  
tccagcttgt tgccagcatg agaaccgcca ttgatgacat tgaacgccgg gactggcagg 60  
atgacttcag agttgccagc caagtcagcg atgtggcggg acagggggac ccccttctca 120  
acggcaccag ctttgagac ggcaaggagc acccccagaa tggcggtcgc accaaactta 180  
gatttatttt ctgttccatc catctcgatc atcagtttgt caatcttctc ttgttctgtg 240  
acgttcagtt tcttgctaac cagggcaggc gcaatagttt tattgatgtg ctcaacagcc 300  
tttgagacac ctttcccat atagcgagtc ttatcattgt cccggagctc tagggcctca 360  
tagataccag ttgaagcacc actgggcaca gcagctctga agagacctt tgaggatgaag 420  
agatcaacct ca 432

<210> 288  
<211> 326  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (254)  
<223> n=A,T,C or G

<400> 288  
tctggctcaa gtcaaagtcc tggctctctt ctccgcctcc ttcttcatca tagtaataaa 60  
cgttgtcccg ggtgtcatcc tctgggggca gtaagggctc tttgaccacc gctctctcc 120  
gaagaaacag caagagcagc agaatcagaa ttagcaaagc aagaattcct ccaagaatcc 180  
ccagaatggc aggaatttgc aatcctgctt cgacaggctg tgccttctca cagacgccgg 240  
cggccccctc acantcacac acgtgacct ctaaggtggg cacttggtct ttattctggt 300  
tatccatgag cttgagattg attttg 326

<210> 289  
<211> 451  
<212> DNA  
<213> Homo sapiens

<400> 289  
gtcccgggtgt ggctgtgccg ttggtcctgt gcggtcactt agccaagatg cctgaggaaa 60  
cccagaccga agaccaaccg atggaggagg aggagggtga gacgttcgcc tttcaggcag 120  
aaattgcca gttgatgtca ttgatcatca atactttcta ctgaacaaa gagatctttc 180  
tgagagagct catttcaaat tcatcagatg cattggacaa aatccggtat gaaagcttga 240  
cagatcccag taaattagac tctgggaaag agctgcatat taaccttata ccgaacaaac 300  
aagatcgaac tctcactatt gtggatactg gaattggaat gaccaaggct gacttgatca 360  
ataaccttgg tactatcgcc aagtctggga ccaaagcgtt catggaagct ttgcaggctg 420  
gtgcagatat ctctatgatt ggacctcggc c 451

<210> 290  
<211> 494  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature

&lt;222&gt; (421)

&lt;223&gt; n=A,T,C or G

&lt;400&gt; 290

```
tttttttttt tcaaaacagt atatttttatt ttacaatagc aaccaactcc ccagtttggt 60
tcaattgtga catctagatg gcttaagatt actttctggt ggtcacccat gctgaacaat 120
atttttcaat ctccaaaca gcaaagactc aaaagagatt ctgcatttca catcagttca 180
caagttcaag agtcttccat ttatcttagc ttttggaata aattatcttt gaggtagaag 240
gacaatgacg aagccactta attccttggt tctgcataaa agcagattta ttcatacaca 300
cttcatttat gtgaataaag cagatgatga taaaatgttc tcttattctt gtttaatcag 360
tagtggtagt gatgccagaa acttgtaaag gcacttcaaa ccaattgtgg ctcaagtgtg 420
ngtgggtccc caaggctggg accaatgaga ctgggggttg ggaattaggt ggtcatcatc 480
cctcctgctg ccca 494
```

&lt;210&gt; 291

&lt;211&gt; 535

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 291

```
tcgcgtgctt aacatgaaaa caaactttgt gctggttggt tcattgtatg cattgatgga 60
gtcttgcttc tcatcatggg gtgtctgacc atccaacctg cagtactcat aatttctcca 120
catgcaataa tcttccaaaa tgtccaatac ccttgtcatt tgactgaaga ttagtactcg 180
tgaaccttgt tcttttaact tagggagcag cttgtctaaa accaccattt tgccactggt 240
ggttactaga tgcatactct ttgtataagg tggaccaggt tctgctccat caaagagata 300
tggatgatta caacattttc tcaactgcat taggatgttc aataacctca ttttgctcat 360
cttgccctgt gagttgagta tatctatata cttcattaat atccgagtat accattccct 420
ttgcattttg ctgaggccca catagatttt tacttccttc tttggaggca aactcttttc 480
aacatcagcc ttaattcgac gaaggaggaa tggacgcaaa accatatgaa gcctc 540
```

&lt;210&gt; 292

&lt;211&gt; 376

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(376)

&lt;223&gt; n=A,T,C or G

&lt;400&gt; 292

```
tacnagcccg tgctgatcga gatcctgggtg gaggtgatgg atccttcctt cgtgtgcttg 60
aaaattggag cctgcccctc ggcccataag cccttggttg gaactgagaa gtgtatatgg 120
ggcccaagct actggtgccg gaacacagag acagcagccc agtgcaatgc tgctgagcat 180
tgcaaacgcc atgtgtggaa ctaggaggag gaatattcca tcttggcaga aaccacagca 240
ttgggttttt tctacttggt tgtctggggg aatgaacgca cagatctggt tgactttggt 300
ataaaaaatag ggctccccca cctcccccat ttttgtgtcc tttattgnag cattgctgtc 360
tgcaaggagg ccccta 376
```

&lt;210&gt; 293

&lt;211&gt; 320

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 293

90

```

tcggctgctt cctggctctgg cggggatggg tttgcttttg aaatcctcta ggaggctcct 60
cctcgcatgg cctgcagtct ggcagcagcc ccgagttggt tcctcgctga tcgatttctt 120
tcctccaggt agagttttct ttgcttatgt tgaattccat tgcctctttt ctcatcacag 180
aagtgatggt ggaatcgttt cttttgtttg tctgatttat ggttttttta agtataaaca 240
aaagtttttt attagcattc tgaaagaagg aaagtaaaat gtacaagttt aataaaaagg 300
ggccttcccc tttagaatag                                     320

```

&lt;210&gt; 294

&lt;211&gt; 359

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 294

```

ctgtcataaa ctggctctgga gtttctgacg actccttggt caccaaatgc accatttcct 60
gagacttgct ggctctccg ttgagtcac ttggctttct gtcctccaca gtcctattgc 120
cactgttgat cactagcttt ttcttctgcc cacaccttct tcgactgttg actgcaatgc 180
aaactgcaag aatcaaagcc aaggccaaga gggatgccaa gatgatcagc cattctggaa 240
tttggggtgt ccttatagga ccagaggttg tgtttgctcc acctctctga ctcccatgtg 300
agtgtccatc tgattcagat ccatgagtgg tatgggaccc cccactgggg tggaatgtg 360

```

&lt;210&gt; 295

&lt;211&gt; 584

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (558)

&lt;223&gt; n=A,T,C or G

&lt;400&gt; 295

```

cctgagttgg gctgactgcc agagacagac cctctgggt ctgggtgaac cagccaggca 60
tttacctcag tggttggcac ctggaacctg tccagggccc tcacctgact gaggagccgc 120
cgggcagtga agtaattgtc caggtctatg ctcttgggt ggataccata gccatccaag 180
gtattcctca ggttggtgaa ctgggtctga gtataggcag aactgggccc caggatgatc 240
tcccggagtg ggggaagctg tgaggtcagg taagtatcca cgtccaccg tacccaatc 300
aaactcagca gaatggtgaa ctggagaagt ccttccgtta agtatttctt cagagaaagc 360
attgctgaag gaccagaatg tttatgcttt ttggttttta aaatcttcca aaagacaaat 420
caaggccact gctctgccgc tccagccagc aggttaccct cctcagtgtc aaaccccgtg 480
ccccaccctg gcagaacaca agggatgagc tccctgacgg ccccagagga aagcacaccc 540
tgtggagcca aggccaanga cacactccag accacattca cttt                                     584

```

&lt;210&gt; 296

&lt;211&gt; 287

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 296

```

ccttatcatt cattcttagc tcttaattgt tcattttgag ctgaaatgct gcatttttaat 60
tttaaccaa acatgtctcc tatcctgggt tttgtagcct tcctccacat cttttctaaa 120
caagatttta aagacatgta ggtgtttgtt catctgtaac tctaaaagat cttttttaaa 180
ttcagtccta agaaagagga gtgcttgctc cctaagagtg tttaatggca aggcagccct 240
gtctgaagga cacttctctg ctaagggaga gtggtatttg cagacta                                     287

```

&lt;210&gt; 297

<211> 457  
<212> DNA  
<213> Homo sapiens

<400> 297  
ccaattgaaa caaacagttc tgagaccgtt cttccaccac tgattaagag tgggggtggca 60  
ggtattaggg ataataattca tttagccttc tgagctttct gggcagactt ggtgaccttg 120  
ccagctccag cagccttctt gtccactgct ttgatgacac ccaccgcaac tgtctgtctc 180  
atatcacgaa cagcaaagcg acccaaaggt ggatagtctg agaagctctc aacacacatg 240  
ggcttgccag gaaccatatc aacaatggca gcatcaccag acttcaagaa tttagggcca 300  
tcttccagct ttttaccaga acggcgatca atcttttctc tcagctcagc aaacttgcac 360  
gcaatgtgag ccgtgtggca atccaatata ggggcatagc cggcgcttat ttggcctgga 420  
tggttcagga taatcacctg agcagtgaag ccagacc 457

<210> 298  
<211> 469  
<212> DNA  
<213> Homo sapiens

<400> 298  
tctttgactt tccttgtcta cctcctctgg agatctcaaa ttctccaggt tccatgctcc 60  
cagagatctc aatgattcct gattctcttc ttccaggagt ctgaatgtct cttggttcac 120  
ttccacagac tccagtgggt cttgaatttc cttttctaga ggattcattg ccccttgatt 180  
tatttcttct ggagtcacaca gtggtgcttg agtttctgga gatttcagtg tttccagggt 240  
ctcttgctcc gcagacttca gtgattctag gatctctggt tctaaagatt ttactgcctc 300  
tatgctctct tctttgagtg actttaagaa ctcttgattc tcattttcaa gaggtctagc 360  
tatctcctgg tcaagagact tcagtgggtc tagatccact ttttctgggg gtcttaatgt 420  
catctgatcc tgttccccta gagacctccg tcgctgttga gtctctttt 469

<210> 299  
<211> 165  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(165)  
<223> n=A,T,C or G

<400> 299  
tctgtggaga ggatgaggtt gagggaggtg gggatatnctg ctgctctgac cttaggtaga 60  
gtcctccaca gaagcatcaa antggactgg cacatatgga ctcccttcac aggccacaat 120  
gatgtgtctc tccttcgggc tggncggta tgcacagttg gggtta 165

<210> 300  
<211> 506  
<212> DNA  
<213> Homo sapiens

<400> 300  
tctgaggaaa gtttgggctt attagtattt gctccagcga acctccaagt tttctccatt 60  
goggacaacg taactaccag ctcttgggtc cagtgggtcg cctccactca gaagttccca 120  
gtaggttctg tcattattgt tggcacatag gccctgaata caggtgatat agggccccc 180  
tgagcgctcc tcattgtga aaccaaatat agtatcattc attttctggg cttctccat 240  
cacactgagg aagacagaac catttagcac agtgacattg gtgaaatatg tttcattgat 300

tctcacagag taattgacgg agatatatga ttgtgagtcg ggaggtgtca cagttatagg 360  
ctcatcagcg gagatgttga agttacctga agcagagacg caagaagagt ctttgttaat 420  
atccaagaag gtctttccca tcagggcagg taagacctgg gctgcagcgt ttggattgct 480  
gaatgctcct tgagaaattt ccgtga 506

<210> 301  
<211> 304  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(304)  
<223> n=A,T,C or G

<400> 301  
tcctaaggca gagccccat cacctcaggc ttctcagttc ccttagccgt cttactcaac 60  
tgcccccttc ctctccctca gaatttgtgt ttgctgcctc tatcttgttt tttgtttttt 120  
cttctggggg ggggtctagaa cagtgcctgg cacatagtag gcgctcaata aatacttggt 180  
tgttgaatgt ctctctcttc tttccactct gggaaacctc ngnttctgcc attctgggtg 240  
accctgtatt tntttctggt gccattcca tttgnccagn taatacttcc tcttaaaaaat 300  
ctcc 304

<210> 302  
<211> 492  
<212> DNA  
<213> Homo sapiens

<400> 302  
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tattagattg aatggaaaag cacttgccat ctctgtctag gggtcacaaa ttgaaatggc 120  
tcctgtatca catacggagg tcttgtgtat ctgtggcaac agggagtttc cttattcact 180  
ctttatttgc tgctgtttaa gttgccaacc tccccccca ataaaaattc acttacacct 240  
cctgcctttg tagttctggt attcacttta ctatgtgata gaagtagcat gttgctgcca 300  
gaatacaagc attgcttttg gcaaattaaa gtgcatgtca tttcttaata cactagaaag 360  
gggaaataaa ttaaagtaca caagtccaag tctaaaactt tagtactttt ccatgcagat 420  
ttgtgcacat gtgagagggg gtccagtttg tctagtgtgatt gttattttaga gagtgggacc 480  
actattgtgt gt 492

<210> 303  
<211> 470  
<212> DNA  
<213> Homo sapiens

<400> 303  
tctggggcag caggtagctc ctacggcact agtctacagg gggaaggacg ctctgtgctg 60  
gcagcggtgg ctcatatggc ctgtctgcac tgtaaccaca ggctgggatg tagccaggac 120  
ttggtctcct tggaaagacag gtctgatgtt tggccaatcc agtccttcag accctgcctg 180  
aaacttgtat cttacgtgaa cttaaagaat aaaatgcatt tctaccccgga tctcgcccc 240  
aggactggca cgacaggccc acggcagatt agatcttttc ccagtactga tcgggtgcgtg 300  
gaattccagc caccacttct gattcgattc cacagtgtac ctgtcctctg agtattttta 360  
agaagccatt gtcaccccag tcagtgttcc aggagtggc aaccagccag tagggtgtgc 420  
cattctccac tccccagccc aggatgcgga tggcatggac ctcggccgcg 470

<210> 304



<211> 79  
 <212> DNA  
 <213> Homo sapiens

<400> 304  
 tgtcccattg ttaactcagc ctcaaactctc aactgtcagg ccctacaaag aaaatggaga 60  
 gcctcttctg gtggatgcg 79

<210> 305  
 <211> 476  
 <212> DNA  
 <213> Homo sapiens

<400> 305  
 tcactgagcc accctacagc cagaagagat atgaggaaat tgtaaggaa gtcagcactt 60  
 acattaagaa aattggctac aaccccgaca cagtagcatt tgtgccaatt tctggttgga 120  
 atggtgacaa catgctggag ccaagtgcta acgtaagtgg ctttcaagac cattgttaaa 180  
 aagctctggg aatggcgatt tcatgcttac acaaattggc atgcttgtgt ttcagatgcc 240  
 ttggttcaaag ggatggaaaag tcacccgtaa ggatggcaat gccagtggaa ccacgctgct 300  
 tgaggctctg gactgcatcc taccaccaac tcgtccaact gacaagccct tgcgcctgcc 360  
 tctccaggat gtctacaaaa ttggtggtaa gttggctgta aacaaagttg aatttgagtt 420  
 gatagagtac tgtctgcctt cataggtatt tagtatgctg taaatatatt taggta 480

<210> 306  
 <211> 404  
 <212> DNA  
 <213> Homo sapiens

<400> 306  
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 tcacagaaac tacagaagtc aggacccagg cgaggacctc aggaacaagt gccccctgca 120  
 gacagagaga cgcagtagca acagcttctg aacaactaca taataatgcg gggagaatcc 180  
 tgaagaccac tgcattccac aagcactgac aaccacttca ggattttatt tcttccactc 240  
 taacccccag atccatttat gagaagttag tgaggatggc aggggcatgg aggggtgaagg 300  
 gacagcaagg atggtctgag ggcctggaaa caatagaaaa tcttcgtcct ttagcatatc 360  
 ctggactaga aaacaagagt tggagaagag gggggttgat acta 404

<210> 307  
 <211> 260  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> (1) ... (260)  
 <223> n=A,T,C or G

<400> 307  
 tcctgcttan acatctgtga gggcctcaag ggctgctgcc tcgactttct ccctagctaa 60  
 gtccacccgt ccaggagacac agccagggca ctgctctgtg ctgacttcca ctgcagccaa 120  
 ggggtcaaaat gaagcatctg cggaggccag gactccttgg catcggacac agtcagggga 180  
 aaagccaccc tgactctgca ggacagaggg tctaggggtca tttggcagga gaacactggg 240  
 gtgccaaggg aagcnancat 260

<210> 308

<211> 449  
<212> DNA  
<213> Homo sapiens

<400> 308  
tctgtgctcc cgactcctcc atctcaggta ccaccgactg cactgggcgg ggccctctgg 60  
ggggaaaggc tccacggggc agggatacat ctcgaggcca gtcacacctt ggaggcagcc 120  
caatcaggtc aaagattttg cccaactggt cggcttcaga gtttccacag aagagaggct 180  
ttcgacgaaa catctctgca aagatacagc caacactcca catgtccaca ggtgttgcac 240  
atgtggactg cagaagaact tcgggagctc ggtaccagag tgtaacaacc ttgatcgttt 300  
cggctggcaa gcctggtggg ggtgccttgt ccagatatgt ccttaggtcc tggctctacat 360  
gctcaaacac cagggttacc ttgatctccc ggtcagttcg ggatgtggca cagacgtcca 420  
tcagccggac aacattggga tgctcaaaa 449

<210> 309  
<211> 411  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (384)  
<223> n=A,T,C or G

<400> 309  
ctgtggaaac ctggggtgcc gggtaaatgg agaactccag cttggatttc ttgccataat 60  
caactgagag acgttccatg agcaggaggg tgaaccaga accagttccc ccaccaaagc 120  
tgtggaaaaa caagaagccc tgaagaccgg tgcactggtc agccagcttg cgaattcggc 180  
ccaacacaag gtcaatgatc tccttgccaa tgggtgtagt ccctcgggca tagttattgg 240  
cagcatcttc cttgcctgtg atgagctgct cagggtggaa gagctggcgg taggtgccag 300  
tgcgaaactt atcaatgact gtgggttcca agtctacaaa cacagccggg ggcacgtgct 360  
tgccagcgcc cgtctcactt gaanaagggt gtttgaagga agtcatctcc t 420

<210> 310  
<211> 320  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (250)  
<223> n=A,T,C or G

<400> 310  
tcctcgcca gcttgactcg attagtctc ataaggaag caaggcagat ggtggctgac 60  
cgggaaatgc ctgcctggca gtggacaaac acccttctc cagcattctt gatggagtct 120  
atgaagtcaa tggcctcggt gaaccaggag ctgatgtctg ccttggtggt gtccctccaca 180  
gggatgctct tgtactggta gtgacctca aaatgggttg gacaattggc tgagacgttg 240  
atcaaggcan ttatgccccaa ggcatccagc atgtccttgc gggaagcgtg atacgcactg 300  
cccaggtaca gaaagggcag 320

<210> 311  
<211> 539  
<212> DNA  
<213> Homo sapiens

&lt;400&gt; 311

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tctggcccat gaagctgaag ttgggagaga tgatgcttcg cctctgcttc acaaactcaa 60
aggcctcgtc cagcttgact cgattagtc tcataaggta agcaaggcag atgggtggctg 120
accgggaaat gcctgcctgg cagtggacaa acacccttc tccagcattc ttgatggagt 180
ctatgaagtc aatggcctcg ttgaaccagg agctgatgtc tgccttgagg ttgtcctcca 240
cagggatgct cttgtactgg tagtgacct caaaatgggt gggacaattg gctgagacgt 300
tgatcaaggc agttatgccc aaggcatcca gcatgtcctt gcgggaagcg tgatacgcac 360
tgcccaggta cagaaagggc aggatttcca ccgggccacc ctgaaatcca gaaatatcca 420
acattcatca agcttgctca aagccaaggc cagtgcccat acccacaaaa actttctgct 480
ggaaaagtca atttcagata ccgagtgaac tcagtctctg tgctggagga taaataaat 540
```

&lt;210&gt; 312

&lt;211&gt; 475

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 312

```
tcaaggatct tcctaaagcc accatgtgag aggattcgga cgagagtctg agctgtatgg 60
cagaccatgt cctgctgttc tagggcatg actgtgtgta ctctaaagtt gccactctca 120
caggggtcag tgataccac tgaacctggc aggaacagtc ctgcagccag aatctgcaag 180
cagcgcctgt atgcaacgtt tagggccaaa ggctgtctgg tgggggtgtt catcacagca 240
taatggccta gtaggtcaag gatccagggt gtgaggggct caaagccagg aaaacgaatc 300
ctcaagtcct tcagtagtct gatgagaact ttaactgtgg actgagaagc attttcctcg 360
aaccagcggg catgtcggat ggctgctaag gcaactctgca atactttgat atccaaatgg 420
agttctggat ccagttttcg aagattgggt ggcactgttg taatgagaat cttca 480
```

&lt;210&gt; 313

&lt;211&gt; 456

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 313

```
tccacttaaa ggggtgcctct gccaaactggt ggaatcatcg ccacttccag caccacgcca 60
agcctaacat cttccacaag gatcccgatg tgaacatgct gcacgtgttt gttctgggag 120
aatggcagcc catcgagtac ggcaagaaga agctgaaata cctgccctac aatcaccagc 180
acgaataactt cttcctgatt gggccgcccgc tgctcatccc catgtatttc cagtaccaga 240
tcatcatgac catgatcgtc cataagaact ggggtggacct ggcctgggccc gtcagctact 300
acatccgggt cttcatcacc tacatccctt tctacggcat cctggggagcc ctccctttcc 360
tcaacttcat caggttcctg gagagccact ggtttgtgtg ggtcacacag atgaatcaca 420
tcgtcatgga gattgaccag gaggacctcg gcccgc 456
```

&lt;210&gt; 314

&lt;211&gt; 477

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 314

```
tgcgtgggct tctggaagcc tggatctgga atcattcacc agattattct ggaaaactat 60
gcgtaccctg gtgttcttct gattggcact gactcccaca ccccaaatgg tggcggcctt 120
gggggcatct gcattggagt tgggggtgcc gatgctgtgg atgtcatggc tgggatcccc 180
tgggagctga agtgcaccaa ggtgattggc gtgaagctga cgggctctct ctccggttgg 240
tcctcaccca aagatgtgat cctgaagggt gcaggcatcc tcacggtgaa aggtggcaca 300
ggtgcaatcg tggaatacca cgggcctggg gtagactcca tctcctgcac tggcatggcg 360
acaatctgca acatgggtgc agaaattggg gccaccactt ccgtgttccc ttacaaccac 420
```

aggatgaaga agtatctgag caagaccggc cggaagaca ttgccaatct agctgat 477

<210> 315

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 315

cagggtactgg atgtcaggtc tgcgaaactt cttanatttt gacctcagtc cataaaccac 60  
actatcacct cggccatcat atgtgtctac tgtggggaca actggagtga aaacttcggt 120  
tgctgcaggt ccgtgggaaa atcagtgacc agttcatcag attcatcaga atggtgagac 180  
tcatcagact ggtgagaatc atcagtgtca tctacatcat cagagtcgtt cgagtcaatg 240  
g 241

<210> 316

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 316

nttntgtgat agtgtgggtt atggactgag gncaaaatnt aagaagtttc gcagacctga 60  
catccaancc tgcccgngcg gncgctcgaa aggnegaatt ctgcagatat ccatcacact 120  
ggcgcccgct cgagcatgca tctagagggc ccaattcgcc ctatantgag tnatattaca 180  
attcactggc cgtcnnttta caacgtcgtg actgggaaaa ccctggcgtt acccaactta 240  
a 241

<210> 317

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 317

aggtaccctg ctcancagcc tggngccctg ggttgtctcc ttgtccatcc actggtccat 60  
tctgtctctgc atttttttgc tctcttttgc gaggttccac tttgggtttg ggctttgaaa 120  
ttatagggtc acaantacct cggccgaaac cacnctaagg gcgaattctg cagatatcca 180  
tcacactggc ggncgctcga gcatgcatct agagggccca attcgcccta tagtgagtcg 240  
t 241

<210> 318

<211> 241

<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(241)  
<223> n = A,T,C or G

<400> 318  
cgngnacaan ntacattgat gganggtntg nggntctgan tntttantta cantggagca 60  
ttaatatattt cttnaacgtn cctcaccttc ctgaantaaa nactctgggt tgtagcgctc 120  
tgtgctnana accacntnaa ctttacatcc ctcttttggga ttaatccact gcgcggccac 180  
ctctgccgcy accacgctaa gggcnaattc tgcagatata catcacactg gcggccgctc 240  
n 241

<210> 319  
<211> 241  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(241)  
<223> n = A,T,C or G

<400> 319  
caggtactga tcgggtgcgtg gaantccagc caccantntt gattcgattc cacagtgatc 60  
ctgtcctctg agtatatttaa agaagccatt gtcacccagc tcagtgttcc aggagttggc 120  
aaccagccag taggggtgtg cattctccac tccccagccc aggatgcgga tggcatggcc 180  
acccatcatc tctccggtga cgtgttggtta cctcggccgc gaccacgcta agggcgaatt 240  
c 241

<210> 320  
<211> 241  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(241)  
<223> n = A,T,C or G

<400> 320  
ggcaggtagc aacagagctt agtaatntct aaaaagaaaa aatgatcttt ttccgacttc 60  
taaacaagtg actatactag cataaatcat tctagtaaaa cagctaagggt atagacattc 120  
taataatttg ggaaaacctg tgattacaag tgaaaactca gaaatgcaaa gatgttggtt 180  
ttttgtttct cagtctgctt tagcttttaa ctctnnnaan cncatgcaca cttgnaactc 240  
t 241

<210> 321  
<211> 241  
<212> DNA  
<213> Homo sapiens

<220>

<221> misc\_feature  
<222> (1)...(241)  
<223> n = A,T,C or G

<400> 321  
angtaccaac agagcttagt aattnntaaa aagaaaaaat gatctttttc cgacttctaa 60  
acaagtgact atactagcat aaatcattct agtaaaacag ctaagggtata gacattctaa 120  
taatttgga aaacctatga ttacaagtga aaactcagaa atgcaaagat gttgggtttt 180  
tgtttctcag tctgctttag cttttaactc tggaagcgca tgcacacntg aactctgctc 240  
a 241

<210> 322  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 322  
ggtaccaaca gagcttagta atttctaaaa agaaaaaatg atcttttttc gacttctaaa 60  
caagtgacta tactagcata aatcattctt ctagtaaaac agctaaggta tagacattct 120  
aataatttgg gaaaacctat gattacaagt aaaaactcag aaatgcaaag atgttggttt 180  
tttgtttctc agtctgcttt agcttttaac tctggaagcg catgcacact gaactctgct 240  
c 241

<210> 323  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 323  
cgagggtactc tcgtatcctc agccttggtc tatttcttta ttttagcttt acagagatta 60  
ggtctcaagt tatgagaatc tccatggctt tcaggggcta aacttttctg ccattctttt 120  
gctcttaccg ggctcagaag gacatgtcag gtgggatacg tgtttctctt tcagagctga 180  
agaaaggggc tgagctgcgg aatcagtaga gaaagccttg gtctcagtga ctccctggct 240  
t 241

<210> 324  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 324  
agggtactgtc gtatcctcag cttgttctta tttctttatt ttagctttac agagattagg 60  
tctcaagtta tgagaatctc catggctttc aggggctaaa cttttctgcc attcttttgc 120  
tcttaccggg ctcagaagga catgtcaggt gggatacgtg tttctcttct agagctgaag 180  
aaaggggtctg agctgcggaa tcagtagaga aagccttggt ctcaagtact ccttggcttt 240  
c 241

<210> 325  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 325  
ggcaggtaca tttgttttgc ccagccatca ctcttttttg tgaggagcct aaatacatte 60  
ttctgggggt ccagagtccc cattcaaggc agtcaagtta agacactaac ttggcccttt 120

cctgatggaa atatttcctc catagcagaa gttgtgttct gacaagactg agagagttac 180  
atgttgaggaa aaaaaaagaa gcattaactt agtagaactg aaccaggagc attaagttct 240  
g 241

<210> 326

<211> 241

<212> DNA

<213> Homo sapiens

<400> 326

gcagggtacat ttgttttgcc cagccatcac tcttttttgt gaggagccta aatacattct 60  
tcctgggggtc cagagtcccc attcaaggca gtcaagttaa gacactaact tggccctttc 120  
ctgatggaaa tatttcctcc atagcagaag ttgtgttctg acaagactga gagagttaca 180  
tgttgggaaa aaaaagaagc attaaccttag tagaactgat ccaggagcat taagttctga 240  
a 241

<210> 327

<211> 241

<212> DNA

<213> Homo sapiens

<400> 327

ggtaccagac caagtgaatg cgacagggaa ttatttcctg tggtgataat tcatgaagta 60  
gaacagtata atcaaaatca attgtatcat cattagtttt ccactgcctc acactagtga 120  
gctgtgccaa gtagtagtgt gacacctgtg ttgtcatttc ccacatcacg taagagcttc 180  
caaggaaagc caaatcccag atgagtctca gagagggatc aatatgtcca tgattatcag 240  
g 241

<210> 328

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 328

ggtacnagac caaatgaang ccacagggaa ttatttcctg tggtgataat tcatgaagta 60  
gaacantata atcaaaatca attgtatcat cattagtttt ccactgcctc acactagtga 120  
gctgtgccaa gtagtagtgt gacacctgtg ttgtcatttc ccacatcacg taagagcttc 180  
caaggaaagc caaatcccag atgagtctca gagagggatc aatatgtcca tnatcatcan 240  
g 241

<210> 329

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(241)

<223> n = A,T,C or G

100

&lt;400&gt; 329

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ttcaggctcga gttggctgca gattttgtggt gcnttctgag cgtctgtcc tgcgccaaaa 60
ngcttcaaag tattattaaa aacatatgga tccccatgaa gccctactac accaaagttt 120
accaggagat ttggatagga atggggctga tgggcttcat cgtttataaa atccgggctg 180
ctgataagaa gtaaggcttt gaaagcttca gcgcctgctn ctggtcanna ctaaccatan 240
n                                                                 241
```

&lt;210&gt; 330

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 330

```
ttttgtgcag atttgtggtg cgttctgagc cgtctgtcct gcgccaaagat gcttcaaagt 60
attattaaaa acatatggat ccccatgaag cccactaca ccaaagtta ccaggagatt 120
tgataggaa tggggctgat gggcttcac gtttataaaa tccgggctgc tgataaaaga 180
agtaaggctt tgaaagcttc agcgctgct cctggctcgc actaaccaga tttacttgga 240
g                                                                 241
```

&lt;210&gt; 331

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(241)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 331

```
nttttaggna ctttgggctc cagacttcac tggctttagg nattgaaacc atcacctggn 60
ntgcattcct catgactgag gttaacttaa aacaaaaatg gtaggaaagc tttcctatnc 120
ttcnggtaag anacaaatnt nctttaaaaa aangtggaag gcatgacnta cgtgagaact 180
gcacaaactg gccactgaca aaaatgaccc ccatttgtgt gacttcattg agacacatta 240
c                                                                 241
```

&lt;210&gt; 332

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 332

```
tgtgaggaga gggaacatgc tgagaaactg atgaagctgc agaaccaacg aggtggccga 60
atcttccttc aggatatcaa gaaaccagac tgtgatgact gggagagcgg gctgaatgca 120
atggagtgtg cattacattt ggaaaaaat gtgaatcagt cactactgga actgcacaaa 180
ctggccactg acaaaaatga cccccatttg tgtgacttca ttgagacaca ttacctgaat 240
g                                                                 241
```

&lt;210&gt; 333

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature



```
<210> 334
<211> 241
<212> DNA
<213> Homo sapiens
```

```

<400> 334
tacctgctgn aggggntgaa gncntctctg ctgccccagg catctgcanc ccctgctgct 60
ggttctgccc ctgctgcagc agaggagaag aaagatgaga agaaggagga gtctgaagag 120
tcagatgatg acatgggatt tggccttttt gattaaannc ctgctcccct gcaaataaag 180
cctttttaca caaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aagcttgtag ctgcccnngc 240
g                                                    241

```

```
<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G
```

```
<210> 336
<211> 241
<212> DNA
<213> Homo sapiens
```

```
<400> 336
taccaaccta tgcagccaag caacctcagc agttcccatc aaggccacct ccaccacaac 60
cgaaagtatc atctcagggg aacttaattc ctgcccgctc tgctcctgca cctcctttat 120
atagttccct cacttgattt ttttaacctt ctttttgcaa atgtcttcag ggaactgagc 180
taatactttt ttttttcttg atgttttctt gaaaagcctt tctgttgcaa ctatgaatga 240
a 24
```

102

<210> 337  
<211> 241  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(241)  
<223> n = A,T,C or G

<400> 337  
ggtactgtat gtagctgcac tacaacagat tcttaccgtc tccacanagg tcatanattg 60  
taaattggtta atactgactt tttttttatt cccttgactc aagacagcta acttcatttt 120  
cagaactgtt ttaaaccctt gtgtgctggt ttataaaaata atgtgtgtaa tccttggtgc 180  
tttcctgata ccagactgtt tcccgtggtt ggtagaata tattttgntt tgatgcttat 240  
a 241

<210> 338  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 338  
aggtacaggt gtgcgctgag ccgagtttac acggaaagga taaagcccat ttagtttctt 60  
ctcaaatgga gttttccact ttcctttgaa gtagacagca ttcaccagga tcatcctggt 120  
atccccatct acagaacctt caggtaacaa gtttgggatt ttgcctttgg tttagtctt 180  
gacccaggaa ttaatctttt ttctagcttc ttctgcacat tctaggaagt ctactgcctg 240  
g 241

<210> 339  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 339  
taccgacggc tcctggaggg agagagtga gggacacggg aagaatcaaa gtcgagcatg 60  
aaagtgtctg caactccaaa gatcaaggcc ataaccagg agaccatcaa cggaagatta 120  
gttctttgtc aagtgaatga aatccaaaag cagcatgag accaatgaaa gtttccgcct 180  
gttgtaaaat ctattttccc ccaaggaaag tccttgcaca gacaccagtg agtgagttct 240  
a 241

<210> 340  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 340  
gtagccctca cacacacatg cccgtaacag gatttatcac aagacacgcc tgcagttaga 60  
ccagacacag ggcgtatgga aagcacgtcc tcaagactgt agtattccag atgagctgca 120  
gatgcttacc taccacggcc gtctccacca gaaaaccatc gccaaactcct gcgatcagct 180  
tgtgacttac aaaccttgtt taaaagctgc ttacatggac ttctgtcctt taaaagcttc 240  
c 241

<210> 341

103

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 341

```
gtaccgccta ctttcgtctc atgtctccga acttcttgct gatggccggt ccaacggtgc 60
tgaaagctgc agttgccttt tgccctgcgt gactcagggt ttcattgtgt ttctttagg 120
cagtggtagt ctgcatgtca tgccagcttt tgctgaagtt ctgttttaat tcattcatca 180
ggttcatgcc gagttttgtt ttatctcaac tagatgcctt tctttcgctg acaaaacttg 240
t                                                                 241
```

&lt;210&gt; 342

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 342

```
gtacattggt gctataaata taaatgctac ttatgaagca tgaaattaag cttctttttt 60
cttcaagttt tttctcttgt ctagcaatct gttaggcttc tgaaccaaga ccaaagtgtt 120
acgttcctct gctgcatacc aacgttactc caaacaataa aaatctatca tttctgctct 180
gtgctgagga atggaaaatg aaacccccac cccctgaccc ctaggactat acagtggaaa 240
c                                                                 241
```

&lt;210&gt; 343

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 343

```
gtacatgtgg tagcagtaat ttttttgaag caactgcact gacattcatt tgagttttct 60
ctcattatca gattctgttc caaacaagta ttctgtagat ccaaatggat taccagtgtg 120
ctacagactt cttattatag aacagcattc tattctacat caaaaatagt ttgtgtaagt 180
tagttttggg taccatctaa aatattttta aatgttcttt acataaaaat ttatgttgtg 240
t                                                                 241
```

&lt;210&gt; 344

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 344

```
ggtacaaaat tgttggaatt tagctaatag aaaaacatag taaatattta caaaaacggt 60
gataacatta ctcaagtcac acacatataa caatgtagac aggtcttaac aaagtttaca 120
aattgaaatt atggagattt cccaaaatga atctaatagc tcattgctga gcatgggtat 180
caatataaca tttaagatct tggatcaaat gttgtccccg agtcttctgc aatccagtcc 240
t                                                                 241
```

&lt;210&gt; 345

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 345

```
ggtacgaagc tgagcgcacg ggggttgccc cagcgtggag cctggacctc aaacttcacg 60
gaaaatgctc tctctctttg acaggcttcc agctgtctcc taatttcttg gatgaactct 120
```

104

ccccggcgat ttaactgata ctgaaaagtg gtgagaggac tgaggaagac aaccagggtca 180  
gcgttagata ggcctctgag ggtggtgccc ttgcctgagg agccaccctt taccaccttg 240  
g 241

&lt;210&gt; 346

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 346

cagggtaccac tgagcctgag atggggatga gggcagagag aggggagccc cctcttccac 60  
tcagttgttc ctactcagac tgttgcactc taaacctagg gaggttgaag aatgagaccc 120  
ttaggtttta acacgaatcc tgacaccacc atctataggg tcccaacttg gttattgtag 180  
gcaaccttcc ctctctcctt ggtgaagaac atcccaagcc agaaagaagt taactacagt 240  
g 241

&lt;210&gt; 347

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 347

agggtacatct aaaggcatga agcactcaat tgggcaatta acattagtgt ttgttctctg 60  
atggtatctc tgagaataact ggttgtagga ctggccagta gtgccttcgg gactgggttc 120  
acccccagggt ctggggcagt tgtcacagcg ccagccccgc tggcctccaa agcatgtgca 180  
ggagcaaattg gcaccgagat attccttctg ccactgttct cctacgtggt atgtcttccc 240  
a 241

&lt;210&gt; 348

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(241)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 348

angtacttgg caagattnga tgctcttgng ctcantgaca tcattcataa cttgttngtg 60  
tgancagagg aggagnncat catcntgtcc tcattcgta gnnncctctc ctctctgaat 120  
ctcaaacaag ttgataatgg agaaaaattt gaattctcag gattgaggct ggactgggtc 180  
cgctacang catacactag cgtggctaag gcccctctgc accctgcatg anaaccctga 240  
c 241

&lt;210&gt; 349

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 349

gcaggtagca tttgtctgac ctctgtaaaa aatgtgatcc tacagaagtg gagctggata 60  
atcagatagt tactgtacc cagagcaata tctgtgatga agacagtgtc acagagacct 120  
gctacactta tgacagaaac aagtgtctaca cagctgtggt ccactcgta tatgggtgtg 180  
agacaaaaat ggtggaaaca gccttaacct cagatgcctg ctatcctgac taatttaagt 240

C 241

<210> 350  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 350  
agg tactgtg gatatttaaa atatcacagt aacaagatca tgcttggtcc tacagtattg 60  
cgggccagac acttaagtga aagcagaagt gtttgggtga ctttcctact taaaattttg 120  
gtcatatcat ttcaaaacat ttgcatcttg gttggctgca tatgctttcc tattgatccc 180  
aaaccaaadc ttagaatcac ttcatttaaa atactgagcg gtattgaata cttcgaagca 240  
g 241

<210> 351  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 351  
tacagaaadc atttgagacc gttttgagac agaagtagag gctctgtcaa gtcaatactg 60  
cattgcagct tgggccactg aagaagccac gcctgagata caaaagatgc actacacttg 120  
acccgcttta tgctcgcttc ctctcccctt ctctctcatc aactttatta ggttaaaaca 180  
ccacatacag gctttctcca aatgactccc tatgtctggg gtttggttag aattttatgc 240  
c 241

<210> 352  
<211> 241  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(241)  
<223> n = A,T,C or G

<400> 352  
gtaccctgtg gagctgcacc aagattannt ggggccatca tgactgcanc cacnacgang 60  
acgcaggcgt gnagtgcacg gtctgacccg gaaacccttt cacttctctg ctcccagagg 120  
gtcctcnggc tcatatgtgg gaaggcanan gatctctgan gagttncctg gggacaactg 180  
ancagcctct ggagaggggc cattaataaa gctcaacatc attggcaaaa aaaaaaaaaa 240  
a 241

<210> 353  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 353  
agg taccagt gcattaattt gggcaaggaa agtgtcataa tttgatactg tatctgtttt 60  
ccttcaaagt atagagcttt tggggaagga aagtattgaa ctgggggttg gtctggccta 120  
ctgggctgac attaactaca attatgggaa atgcaaaagt tgtttgata tggtagtgtg 180  
tggttctctt ttggaatttt tttcaggtga ttttaataata atttaaaaact actataaaaa 240  
c 241

<210> 354  
<211> 241  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(241)  
<223> n = A,T,C or G

<400> 354  
ngcagggtccg ggcagggtacc aagattcatt ctcacacaaa actagaaaca gaagggcaaa 60  
ttccagtttc cttctgggat tgaatacttt caagtaaggt cttcgacaaa caatcagggg 120  
gccaattaat ccactgtaga ggcccttaac ttgatccaca gttgaataat aagcccatgg 180  
aatacaagca gaatcctctg ttccagctcc agatctttct gggattttcc atacgtaagt 240  
g 241

<210> 355  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 355  
ggtagccacc ctaaatttga actcttatca agaggctgat gaatctgacc atcaaatagg 60  
ataggatgga cttttttttg agttcattgt ataaacaaat tttctgattt ggacttaatt 120  
cccaaaggat taggtctact cctgctcatt cactctttca aagctctgtc cactctaact 180  
tttctccagt gtcacagata gggaattgct cactgcgtgc ctactcttcc ttcacttacc 240  
t 241

<210> 356  
<211> 241  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(241)  
<223> n = A,T,C or G

<400> 356  
aggtactgta attgagcatc cggaatntgg agaagtaatt tagctacagg gtgaccaacg 60  
caagaacata tgccagttcc tcgtagagat tggactggct aaggacgac agctgaagg 120  
tcatgggttt taagtgtttg tggctcactg aagcttaagt gaggatttcc ttgcaatgag 180  
tagaatttcc cttctctccc ttgtcacagg tttaaaaacc tcacagcttg tataatgtaa 240  
c 241

<210> 357  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 357  
ttttgtacca ccgatatgat caaggaaaat tctgcccatt tttatggctg aagttctaaa 60  
aacctaattc aaagtcttc catgatccta cactgcctcc aagatggctc aggtggcat 120  
aaggcctgag cggcggtgag atccgaggct gccagcagct tgctgctctt cagctggat 180

gaagccccctc ggccacccga gtctccagga cctgcccggg cgccgctcga aagggcgaat 240  
t 241

<210> 358  
<211> 241  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(241)  
<223> n = A,T,C or G

<400> 358  
aggtacgggg agtgggggtg aagcntgttc tctacatagg caacacagcc gcctaantca 60  
caaagtcagt ggtcggccgc ttcgaccaac atgtggtgag cattccacgg gcgcatgaag 120  
tctgggtgct gtgctcgagt ctctgaatat tttgatagga agcgacaaga aaattcaaac 180  
tgctctttgc tgactactgg aaagtgaaaa gatgctcaag ttaccattc aaagaaacca 240  
t 241

<210> 359  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 359  
gaggtacaca aaaggaatac cttctgagag ccagggagtg aggaaagggg aaggagactt 60  
gacgtcaagg gtgcttttga ggaacatgac gggccagcca gcctgcccna actttgagggc 120  
cctgctgggc tcttgtgact ataaatatac tgtctatttc taatgcaatc cgtctttcct 180  
gaaagatctt gttatctttt actattgaga catgctttca tttttgtggt cctgtttcca 240  
a 241

<210> 360  
<211> 241  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(241)  
<223> n = A,T,C or G

<400> 360  
ngtactctat actaattctg cttttttata cttaattcta aatttctccc ctctaattta 60  
caacaaattt tgtgattttt ataagaatct atgcctcccc aattctcaga ttcttctctt 120  
ttctccttta tttctttgct taaattcagt ataagctttc ttggtatttt aggttcatg 180  
cacattctta ttcctaaaca ccagcagttc ttcagagacc taaaatccag tataggaata 240  
a 241

<210> 361  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 361

108

aggtactctc cgtgccccga cactgaacat tatccagcca gatctgcccc gtgccagctc 60  
ccactttgta cttttcttac tatectgtct agaatcatgt cttatgattt taacagatat 120  
agaaccactc ctagaaaatg ttctttcact ttctcgtttc ctttttaatc tatcatcctg 180  
actactgaac ttaaaatctt tttcttcctt tttttgtttc tcttttcttt tatcctgttc 240  
a 241

<210> 362  
<211> 241  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(241)  
<223> n = A,T,C or G

<400> 362  
aggtactttt atacctngct tangtcagt acagatttac caatgacaac acaattttta 60  
aattecaaca catatattac tttgtcctat gaagggcaaa aagtcaatat attttaaatt 120  
ttaaaaacag aatggatata atgacctttt tacacatcag tgatatttaa aagacttaaa 180  
gagacaatac tatggttgag acactggctt cctattccag ccctaattaa agaaaaata 240  
g 241

<210> 363  
<211> 241  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(241)  
<223> n = A,T,C or G

<400> 363  
ttangtacta aaaacaaaat cctaattctg ttttaaagag ctgggagatg ttaatcatat 60  
gtcagttttt tccacgttat aatttcctaa atgcaaactt ttcaatcagg gcagttcaaa 120  
ttcattacat cacagtaaata aacagtagcc aactttgatt ttatgcttat aggaaaaaaa 180  
atcctgtaga tataaaaaa gcaaattttg acaataaaaa ctcaaaccat tcatccttaa 240  
a 241

<210> 364  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 364  
ggtacaagca gttagtctctg aaggccccctg ataagaatgt catcttctcc ccactgagca 60  
tctccaccgc cttggccttc ctgtctctgg gggcccataa taccaccctg acagagattc 120  
tcaaaggcct caagttcaac ctcacggaga cttctgaggc agaaattcac cagagcttcc 180  
agcacctcct gcgcaccctc aatcagtcca gcgatgagct gcagctgagt atgggaaatg 240  
c 241

<210> 365  
<211> 241  
<212> DNA



<213> Homo sapiens

<400> 365

```
cgaggtagtg agattacagg catgagccac cagccccggc caaaaacatt taaaaaatga 60
ctgtccctgc tcaaatactg cagtaggaaa tgtaatttga catatatcac ttccagaaaa 120
aaactttaaa tctttctata aaatgaattt gatacatcat cagcatgaag tgaagttaaa 180
atctcttaca aagtaaattc aggtatatca acaatgagat ccaaaaagat cgggtcaaga 240
t                                                                 241
```

<210> 366

<211> 241

<212> DNA

<213> Homo sapiens

<400> 366

```
ggcaggtaca catcaaacac ttcattgcct aaatgcaggg acatgcttcc atctgaccac 60
ttgactatcc gagcattgct tcttttaatt tcatttcctt cttcatctcg gcgtatcctc 120
catcttatag tattttctac ctttaatttt aacctgggtc taccttcttc atccagcatt 180
tcttcatctt caaattcatc ttcataatac tgggctctac acttgagaaa gttgggcagt 240
t                                                                 241
```

<210> 367

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 367

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gcaggtacaa ataattcctg ttgtnacatt tagtggacgc gattatctgt atacctcaaa 60
ttttaattta agaaagtatc acttaaagag catctcatct tctatagatt gaggcttaat 120
tactgaaaag tgactcaacc aaaaagcaca taacctttta aaggagctac acctaccgca 180
gaaagtcaga tgccctgtaa ataactttgg tctttcaaaa tagtggcaat gcttaagata 240
c                                                                 241
```

<210> 368

<211> 241

<212> DNA

<213> Homo sapiens

<400> 368

```
tttgtacatt gttaatagtg accctcggag gaaatggatt tctcttctat taaaaactct 60
atggtatata agcattacat aataatgcta cttaaccacc ttttgtctca agaattatca 120
ccaaagtttt ctggaaataa gtccacataa gaattaaata tttaaaaggt gaaatgttcc 180
ttattttaac tttagcaaga tcttttcttt ttcattaaga aacactttaa taattttaaa 240
g                                                                 241
```

<210> 369

<211> 241

<212> DNA

<213> Homo sapiens

110

&lt;400&gt; 369

```
gcaggtaactt tattcttatt tcttatccta tattctgtgt tacagaaaaa ctactaccat 60
aaacaaaaca ccaaccagcc acagcagttg tgtcaagcat gacaattggt ctagtcttca 120
cattttatta gtaagtctat caagtaagag atgaagggtc tagaaaacta gacacaaagc 180
aaccagggtc caaatcacca aggtagatct gtgcttagct aaagggaaac acccgaagat 240
t                                                                 241
```

&lt;210&gt; 370

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(241)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 370

```
ngttcacagt gcccctccgg cctcgccatg aggcctcttc tgctcgctccc ggtcctggtg 60
gtggttctgt cgatcgtctt ggaaggccca gcccagccc aggggacccc agacgtctcc 120
agtgccttgg ataagctgaa ggagtttggg aacacactgg aggacaaggc tcgggaactc 180
atcagccgca tcaaacagag tgaactttct gccaaagatgc gggagtgggt ttcagaagac 240
a                                                                 241
```

&lt;210&gt; 371

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(241)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 371

```
ggcaggatcat cttgagcctt gcacatgata ctcagattcc tcacccttgc ttaggagtaa 60
aacaatatatc ttacaggggt gataataatc tccatagtta tttgaagtgg cttgaaaaag 120
gcaagattga cttttatgac attggataaa atctacaaat cagccctcga gttattcaat 180
gataactgac aaactaaatt atttccttag aaaggaagat gaaaggaggt ggagtgtggt 240
t                                                                 241
```

&lt;210&gt; 372

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(241)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 372

```
aggtagacga aagcgaccct tgggtgnata gatcagacgg aaattctctc ccgtcttgnc 60
aatgctgatg acatccatga atccagcagg gtagggtata tcagttcgga cttgccatc 120
gattttaatg aaccgctgca tgcaaatctt ctttacttca tctcctgtca gggcatactt 180
```

111

aagctctgttc ctcaggaaaa tgatgagggg gagacactct ctcaacttgt ggggaccggg 240  
g 241

&lt;210&gt; 373

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 373

tactgaaaca gaaaaaatgt attcccacaa aagctgttac acagcgggtt cccgtcccca 60  
gaagcagtag aaaatcttag cattccaatg gaaggcatgt atttgtaaaa tattctaaaa 120  
tcagctctat agtttccttg tcctctttga taagggatca gacagagggt gtgtccccc 180  
tcagcagcta ccttctttga caaactgggc tccaataata cctttcagaa acttacaaga 240  
c 241

&lt;210&gt; 374

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 374

caggtactaa aacttacaat aaatatcaga gaagccggtta gtttttacag catcgtctgc 60  
ttaaagcta agttgaccag gtgcataatt tcccatcagt ctgtccttgc agtaggcagg 120  
gcaatttctg ttttcatgat cggaatactc aaatatatcc aaacatcttt ttaaaacttt 180  
gatttatagc tcctagaaag ttatgttttt taatagtcac tctactctaa tcaggcctag 240  
c 241

&lt;210&gt; 375

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 375

aggtacaaaag gaccagtatc cctacctgaa gtctgtgtgt gagatggcag agaacgggtg 60  
gaagaccatc acctccgtgg ccatgaccag tgctctgccc atcatccaga agctagagcc 120  
gcaaattgca gttgccaaata cctatgcctg taaggggcta gacaggattg aggagagact 180  
gcctattctg aatcagccat caactcagat tgttgccaat gccaaaggcg ctgtgactgg 240  
g 241

&lt;210&gt; 376

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 376

ggtacatttt actttccttc tttcagaatg ctaataaaaa acttttggtt atacttaaaa 60  
aaaccataaa tcagacaaac aaaagaaacg attccaacat cacttctgtg atgagaaaag 120  
aggcaatgga attcaacata agcaaagaaa actctacctg gaggaaagaa atcgatcagc 180  
gaagaaacaa ctcggggctg ctgccagact gcaggccatg cgaggaggag cctcctagag 240  
g 241

&lt;210&gt; 377

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(241)  
<223> n = A,T,C or G

<400> 377  
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cttgggactc tagtgtaag atgatgagcc cgtgcatcag gtccttctgc actttgggtg 120  
aagtctccca gggtaggttt cctatttgaa acagtggaaat catgtttcca gtgataaagt 180  
ttaatgacct catccttttt tttttttttc tcactcgcca tttgtgtgtc ttanatgggt 240  
t 241

<210> 378  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 378  
aggtcagcga tcaggtcctt tatgggcagc tgctgggcag cccacaagc ccagggccag 60  
ggcactatct ccgctgcgac tccactcagc ccctcttggc gggcctcacc ccagcccca 120  
agtcctatga gaacctctgg ttccaggcca gcccttggg gacctggta accccagccc 180  
caagccagga ggacgactgt gtctttgggc cactgctcaa cttccccctc ctgcagggga 240  
t 241

<210> 379  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 379  
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aagatgactg ctttactga ggtcaaggat tgtaatatg ccagctttgt aaagccatta 120  
aagcagaagt ttcttcagt atcttctctc taagaaacac catcacctcc atgtgcctta 180  
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c 241

<210> 380  
<211> 241  
<212> DNA  
<213> Homo sapiens

<220>  
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<222> (1)...(241)  
<223> n = A,T,C or G

<400> 380  
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tcggctaana tgcttcngaa ttgaattca tgcacatagg ccttgaaaaa actgtcaaac 180  
tgannctgat caccacacaa gtgggccntn tatgacacaa agcagaaacc tttctcntan 240  
g 241

<210> 381

<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 381  
aggtacaact taatggatta gcttttgggt ttaactgaat atatgaagaa attgggtctg 60  
tctaaagaga gggatattca tatggctttt agttcacttg tttgtatttc atcttgattt 120  
ttttctttgg aaaataaagc attctatttg gttcagattt ctcagatttg aaaaaggctc 180  
tatctcagat gtagtaaatt atttcctttc agtttgtgaa agcaggattt gactctgaaa 240  
g 241

<210> 382  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 382  
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aaaaggattg tcataattta tatgctttat gtttacacct atgatacagt tgccttggaa 120  
cacaaaattt ttcattgtaa ttaaaaaaag aagagttgtg cagacagaag aaatcaaatac 180  
taagaaaatc acaggagtag ataaatactc tagaattcat atacccttgg aagatgggtt 240  
t 241

<210> 383  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 383  
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gtattttaagt ctgtgcaaat aatccttcag aagaaatata caagattctg tttgcagagg 120  
tcattttgtc tctcaaagat gattaaatga gtttctcttc agataaagtg ctctgtcca 180  
gcagaactca aaaggccttc aagctgttca gtaagtgtag ttcagataag actccgtcat 240  
a 241

<210> 384  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 384  
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attctataaa atcagttata tcaacatata aaggagtgtg attttcagtt tgttttttta 120  
agtaaataatg accaaactga ctaaataaga aggcaaaaaca aaaaattatg cttccttgac 180  
aaggcctttg gagtaaacaa aatgctttta ggctcctggt gaatgggggt gcaaggatga 240  
a 241

<210> 385  
<211> 241  
<212> DNA  
<213> Homo sapiens

<400> 385  
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tggtccctga cccacagtg agctgttttag atgaccttc acatcttcct gatcaactgg 120

114

aagacactcc aatcctcagt gaagactctc tggagccctt caactctctg gcaccaggta 180  
ggtttgaggg ctatgtccct ttaacttate catgcagagt agccaaactt tacctgaaag 240  
a 241

&lt;210&gt; 386

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 386

aggtaccttt ttctctcca aaggaacagt ttctaaagtt ttctgggggg aaaaaaact 60  
tacatcaaat ttaaaccata tgtaaactg catattagt gtgttacacc aaaaaattgc 120  
ctcagctgat ctacacaagt ttcaaagtca ttaatgcttg atataaattt actcaacatt 180  
aaattatctt aaattattaa ttaaaaaaaaa aactttctaa gggaaaaata aacaaatgta 240  
g 241

&lt;210&gt; 387

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 387

acccactgg ccgctgtgga gtatctccac tctcccctcg tgagggccgc tcccaccgac 60  
cagtcgaact ttcgtaaagt gagttaatgt gtttccactc cccctttccc ctttctggcc 120  
ttttgggtcca gaatttctcg gccttcgggc atatcctggg agtcctcgac ttccaggaaa 180  
gccaatgtct ccccgatcac ctttaagacc cggaggacct attggacctg gaaatcctcg 240  
t 241

&lt;210&gt; 388

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 388

tttgactct tgtccacagc agagacattg agtataccat tggcatcaat gtcaaaagtg 60  
acttcaatct gaggaacacc tcggggtgca ggaggtatgc ctgtgagttc aaacttgcca 120  
agcaggttgt tatcctttgt catggcacgc tcgccttcat aaacctgaat aagtacacca 180  
ggctggttgt cagaataggt agtgaaggtc tgtgtctgct tggtaggaat ggtggtatta 240  
c 241

&lt;210&gt; 389

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(241)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 389

tacctntggt agtgagcacc ttgtcttntg tgcttatntc ttnaagataa atacatggaa 60  
ggatgtgaaa atcggaacac caactatgtg tctcactgca tctaagtga gacgccacag 120  
ctgtgagagt tttcaaagca gaaagatgct gatgtgacct ctggaattca gacatactga 180  
gctatgggtc agaagtgtt tacttaaaaa gcaaaccaat cccaggaaat actgaatagg 240

a 241

<210> 390  
 <211> 241  
 <212> DNA  
 <213> Homo sapiens

<400> 390  
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 attgccagct gttcaggtgt catcttatct tcttcttcta cagccttatt gtaattcttg 120  
 gctaattcca acatctcttt taccactgat tcattgcgtt tacaatgttc actgtagtcc 180  
 tgaagtgtca aaccttccat ccaactcttc ttatgcaa ttagcaacat cttctgttcc 240  
 a 241

<210> 391  
 <211> 241  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> (1)...(241)  
 <223> n = A,T,C or G

<400> 391  
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 taaanaaaaa nnntannnaa annnggggtt aaatnctntn nncagancat taaaactgaa 120  
 ggggaaaaaa aaaccaaaaa cgagcttntt anttnacntg ggnttggggn gntgctgatn 180  
 tnaagaagca anntttanan cnngcnnnat ganngagngn tcannttgaa atttnnacc 240  
 t 241

<210> 392  
 <211> 241  
 <212> DNA  
 <213> Homo sapiens

<400> 392  
 gaggtactaa atggtatcct tagattaaaa ttttgtgctt gataacagct gttttttcta 60  
 cattagaaat aagatgccac acaaggaact acattccaga tttaaagaaa tgaaaggata 120  
 ccattagtgt gtataacaga ttattgttca tacttgtaaa gcatcttatg tcattgagaa 180  
 tataaagaac agtgccttag aagacagtga aaggtaagct ctagcttaat gtctatgatt 240  
 t 241

<210> 393  
 <211> 241  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> (1)...(241)  
 <223> n = A,T,C or G

<400> 393  
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tacataaact gcctnaaaga tttatgctta caggtagaca ttcaatttac caataaaaca 120  
gcatgttctg aaaatatggg cacattttta aacatattaa gacagttctg ttaaccataa 180  
tagtcccaca gtatgactga gtaataagaa tctacttcaa aagnaaaaaa aaaattaatc 240  
a 241

<210> 394

<211> 241

<212> DNA

<213> Homo sapiens

<400> 394

aggtacagca gcagtagatg gctgcaacaa ccttcctcct accccagccc agaaaatatt 60  
tctgccccac cccaggatcc gggacaaaaa taaagagcaa gcaggcccc ttactgagg 120  
tgctgggtag ggctcagtgc cacattactg tgctttgaga aagaggaagg ggatttgtt 180  
ggcactttta aaatagagga gtaagcagga ctggagaggc cagagaagat accaaaattg 240  
g 241

<210> 395

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 395

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actaccacat agagggtata cacggatgga tcgattacaa gaatataaaa cttattttcc 180  
ttcctgtatc cacatttctt tgcaatgtga atttgcaggc cctctcaaga agtggagtct 240  
a 241

<210> 396

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 396

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cattgatgca ccatccaacc tgcgtttcct ggccaccaca cccaattcct tgctgggtatc 120  
atggcagccg ccacgtgccg ggattaccgg ctacatcatc aagtatgaga agcctgggtc 180  
tcctcccaga gaagtgggtc ctcggtcccg ccctgggtgc acagaggcta ctattactgg 240  
c 241

<210> 397

<211> 241

<212> DNA

<213> Homo sapiens



117

<220>  
 <221> misc\_feature  
 <222> (1)...(241)  
 <223> n = A,T,C or G

<400> 397  
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 tctcatttga gctctccttc atgtggcaga gctgactgtg gcggtttagg agcctacatt 180  
 ttagaaaagc ttacctcaaa gttctgcatt gagcctgagc actggaaagg agataaaata 240  
 a 241

<210> 398  
 <211> 241  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> (1)...(241)  
 <223> n = A,T,C or G

<400> 398  
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 gttatgaaac nantcanctg gatgaccana gtgntgaaac cnacannac angcnntcna 180  
 cattatataa ncggaaagct aatgatgaga gcaatgatca ttccgatgtn attgatagtc 240  
 a 241

<210> 399  
 <211> 241  
 <212> DNA  
 <213> Homo sapiens

<220>  
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 <222> (1)...(241)  
 <223> n = A,T,C or G

<400> 399  
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 ttcagtctgg gttctgcctc agccacgaac tgggaaggag tgaggaacat cccaacggca 180  
 atgagagtat ccagtgact ccaaacagga angaatcagt gttcanaaag tcagggccct 240  
 t 241

<210> 400  
 <211> 241  
 <212> DNA  
 <213> Homo sapiens

<400> 400  
 ggtactcttg ctcttttagc tagagtgtat gtgaaaataa agaaatacat cattgtattc 60  
 acaaccatgt gtcttcattt ataacttttt gtttaaaaaa tttttagttc aagtttagtt 120

118

cattgatatt atcctctgaa tgcagttaag gctgggcaga aattctactc atgtgacatc 180  
tgccacaggt ctattttgaa gcttttcttc taatgggcaa tgtttgtcct taccaggatt 240  
t 241

&lt;210&gt; 401

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(241)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 401

nncaggtact ttgtagagca gagagaggct ttggttcctc cttttcttcaa tcacgtggag 60  
atgtgtcatc acctgggatt tcattctgggc cgccttttct gggcacaacag ccaacacatg 120  
ctggtaaatga cggatgggat gtaagcgatc tttgtttctca gcacggacat aacgccgtaa 180  
ggcctggaga atgcgatgag gccgtggcgg gtcagactgc aaggcagcca ggtagttctc 240  
c 241

&lt;210&gt; 402

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(241)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 402

ggcaggtcca aaaaaaacct aaaaanngtt tcaggaatgt agagaaatat ccaacttaaa 60  
tagcgaaaaa gtgcaccata attactgctg cactgcagtc atttctgcaa ttcccatgtt 120  
tcttaaataa ctatcttgtc agataacaca caatataaag agcaattatg aaaaacagac 180  
atttacatat acttctaaag tcttattggg aatatcctgt ttggccattg ggataaccaa 240  
t 241

&lt;210&gt; 403

&lt;211&gt; 241

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(241)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 403

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gccggctatg tccaaagtaa tggagatgtt ccagcctagt gcggtggtct tacagtgtgg 120  
ctcagactcc ctatctgggg atcggttagg ttgcttcaat ctaactatca aaggacacgc 180  
caagtgtgtg gaatttgtca agagctttaa cctgcctatg ctgatgctgg gaggcggtgg 240  
t 241

<210> 404  
 <211> 241  
 <212> DNA  
 <213> Homo sapiens

<400> 404  
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 ttgtttatag tgagtaacct tgtaggagtc ggtggccagg aggatgttga actcggcttc 180  
 tgccgcagga ttcactctcg gccggaggac aaggggcccc cgccgcgcga gctccctgac 240  
 c 241

<210> 405  
 <211> 266  
 <212> DNA  
 <213> Homo sapiens

<400> 405  
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 aggtttttct ccagatttga gaactctaga ttctgcatca ttatctttga gtctatattc 120  
 tcttgggctg taagaagatg aggaatgtaa taggtctgcc ccaagccttt catgccttct 180  
 gtaccaagct tgtttccttg tgcactcttc ccaggctctg gctgcccctt attggagaat 240  
 gtgatttcca agacaatcaa tccaca 266

<210> 406  
 <211> 231  
 <212> DNA  
 <213> Homo sapiens

<400> 406  
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 tcacgcatct cgttcagaat gcggctcagg tccacgccag gtgcagcgtc catctccaca 120  
 ttgacatctc caccacactg gcctctcagg gcattcatct cctcctcgtg gttcttcttc 180  
 aggtaggcca gctcctcctt caggctctca atctgcatct ccaggtcagc t 231

<210> 407  
 <211> 266  
 <212> DNA  
 <213> Homo sapiens

<400> 407  
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 tgaccacaaa taaataaagg aaaactaagc tgcattgtgg gttttgaaaa gggtattata 180  
 cttcttaaca attctttttt tcagggaactt ttctagctgt atgactgtta cttgaccttc 240  
 tttgaaaagc attcccaaaa tgcctt 266

<210> 408  
 <211> 261  
 <212> DNA  
 <213> Homo sapiens

<400> 408  
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120

ctcacttgaa gggctctgcat ttgggtcctc tggctctcttg ccaagtttcc cagccactcg 180  
agggagtaat atctggaggg caaagaagag acttatgtta ttgttgaacc tccagccaca 240  
gggaggagca tgggcatggg t 261

<210> 409  
<211> 266  
<212> DNA  
<213> Homo sapiens

<400> 409  
gctgacagta atacactgcc acatcttcag cctgcaggct gctgatgggtg agagtgaat 60  
ctgtcccaga cccgctgcca ctgaatcggg cagggatccc ggattcccgg gtagatgccc 120  
agtaaagtga cagtttagga ggctgtcctg gtttctgctg gtaccaagct aagtagttct 180  
tattgttgga gctgtctaaa acactctggc tggctcttgca gttgatgggtg gccctctcgc 240  
ccagagacac agccagggag tgtgga 266

<210> 410  
<211> 181  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(241)  
<223> n = A,T,C or G

<400> 410  
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tttgnnggatg gggacttgtg aatttttcta aaggggnnnn ttnannnngg aagaaaaccn 120  
ngntccgggtt ccagccaaac cngtngctna ctttccacct tntttccacc tccctcnggt 180  
t 181

<210> 411  
<211> 261  
<212> DNA  
<213> Homo sapiens

<400> 411  
gccccctgcag tacttggccg atgtggacac ctctgatgag gaaagcatcc gggctcacgt 60  
gatggcctcc caccattcca agcggagagg ccgggcgtct tctgagagtc agggctctagg 120  
tgctggagtg cgcacggagg ccgatgtaga ggaggaggcc ctgaggagga agctggagga 180  
gctggccagc aacgtcagt accaggagac ctcgtccgag gaggaggaag ccaaggacga 240  
aaaggcagag cccaacaggg a 261

<210> 412  
<211> 171  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(241)  
<223> n = A,T,C or G

<400> 412

121

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cagagctgta tctgcaggnt cgtaagcata nagacngttt gaatatcttc cagngatatc 120
ggctcraact gncagagatg ggtcaacaaa cataatcctg gggacatact g 171

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&lt;210&gt; 413

&lt;211&gt; 266

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 413

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ttaggaccaa agatagcatc aactgtatct gaaggaactg tagtttgcgc attttatgac 60
atttttataa agtactgtaa ttctttcatt gaggggctat gtgatggaga cagactaact 120
cattttgtta ttgcatctaa aattatcttg ggtctctgtt caaatgagtt tggagaatgc 180
ttgacttggt ggtctgtgta aatgtgtata tatatatacc tgaatacagg aacatcggag 240
acctattcac tcccacacac tctgct 266

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&lt;210&gt; 414

&lt;211&gt; 266

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(241)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 414

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tttgccataa ttgagtgaag agtggcagat ggcattaact ctgctccgct tcaagctggc 60
tccatgacca ctcaaggcct cccancctg ttcgtcaagt tgcctcaag tccaagcaat 120
ggaatccatg tgtttgcaaa aaaagtgtgc tanttttaag gnccttcgta taagaatnaa 180
tganacaatt ttcctaccaa aggangaaca aaaggataaa tataatacaa aatatatgta 240
tatgggtggt tgacaaatta tataac 266

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&lt;210&gt; 415

&lt;211&gt; 266

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(241)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 415

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cctccatcca gtctattaat tgttgccggg aagctanagt aagtagttcg ccagttaata 60
gtttgcgcaa cgttgttgcc attgctacag gcatcggtgt gtnacgctcg tcgattggta 120
tggcttcatt cagctccggt tcccaacgat caaggcgagt tacatgatcc cccatgttgt 180
gcaaaaaagc ggtagctcc ttcggtcctc cgatcggtgt canaagtaag ttggccgcag 240
tgttatcact catggttatg gcagca 266

```

&lt;210&gt; 416

&lt;211&gt; 878

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

122

&lt;400&gt; 416

```

cctgacgata gccatggctg taccacttaa ctatgattct attccaactg ttcagaatca 60
tatcacaaaa tgacttgtag acagtagttt acaacgactc ccaagagagg aaaaaaaaaa 120
aaaaagacgc ctcaaaattc actcaacttt tgagacagca atggcaatag gcagcagaga 180
agctatgctg caactgaggg cacatatcat tgaagatgtc acaggagtgt aagagacagg 240
ctggaaaaaa tctcactata agcaaacagt agtatctcat accaagcaaa accaagtagt 300
atctgctcag cctgccgcta acagatctca caatacacia ctgtgcttta ggactgtcac 360
caaagtccaga ttcgggtgcta accagggtggc atctatgata aacgtcgccc ctcttattta 420
acaaagggct ctgaaggagg tgttctccaa gcaacaagga gactgcttca gtacaagact 480
ttgcaccttg aattcaattg catcaagtgt ggatagcaaa ataagtatct taccattgaa 540
atatgtgttc agcctaagat ttaccaccac agcagaacaa aagtgagggg gagagggatg 600
ggccagttag gggatggggg agaaaaaaaa atcacaggat taccacaaa gccttggttt 660
aaaagggctc ccttcactat tcaggaaggg aagtggagg agaaattaac caattcctgc 720
cacagcagcc ctttttggtt gcttccacaa tagatacttt atggagtggc acagccaacc 780
ctatctgtga cctgccctgc ggataaacac agccaagcag gtttaattag atcaaagaca 840
caaagggcta ttcctctctt tcataacaac gcagacct 878

```

&lt;210&gt; 417

&lt;211&gt; 514

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 417

```

ttctgacttc tagaagacta aggtctggtct gtgtttgctt gtttgccac ctttggtga 60
taccagaga acctggycac ttgctgcctg atgccacccc ctgccagtca ttcctccatt 120
caccagcgg gaggtgggat gtgagacagc ccacattgga aaatccagaa aaccgggaac 180
agggatttgc ccttcacaat tctactcccc agatcctctc ccctggacac aggagaccca 240
cagggcagga ccctaagatc tggggaaagg aggtcctgag aaccttgagg tacccttaga 300
tccttttcta cccactttcc tatggaggat tccaagtcac cacttctctc accggcttct 360
accagggctc aggactaagg cgttttctcc atagcctcaa cattttggga atcttccctt 420
aatcacccct gctcctcctg ggtgcctgga agatggactg gcagagacct ctttggtgctg 480
ttttgtgctt tgatgccagg aatgccgcct agtt 514

```

&lt;210&gt; 418

&lt;211&gt; 352

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 418

```

ctgcaccagc gattaccagt ggcattcaaa tactgtgtga ctaaggattt tgtatgctcc 60
ccagtagaac cagaatcaga caggtatgag ctagtcaaca gcaagtcttt gttggattcg 120
agtaggctca ggatctgctg aaggctcggag gagttagtcc ccgcaatcaa gagcctgtct 180
tcctgaagcc cttgggtgata ttttgccact cagccaagaa tgaggatgca tccttcagat 240
tctctatgtc ccgaacctgg aaccatcca cgccagcttg cagccaaaac tccagagcat 300
ccttcacctt ggtggaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aa 352

```

&lt;210&gt; 419

&lt;211&gt; 344

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 419

```

ctggacacca taatcccttt taagtggctg gatggtcaca cctctcccat tgacaagctg 60
ggttaagtca ataggttgac taggatcaac acgacccaaa tcaataagat actgcagtct 120
attgagactc aaaggcttat actggcgtct gaaactatgt ccttcgttaa acccgatttt 180

```

123

tgggattcgg atgtaaaatg gagtctggcc tccctcaaag cccaagcggg gccgggttcc 240  
tctttgcctt tctcctttat ggccctctgcc acattttcta cctcttctcc gacctcttgg 300  
tcttctctcc ggtttcttgg agccgggatt cggtttaag ttgg 344

&lt;210&gt; 420

&lt;211&gt; 935

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 420

cgaaagtcaa cgtaagggg ctcagggtgaa ccatgatgat gaccttctgt tgactttgaa 60  
atattggctc ttgtgggtga caaaagccag acaagctgtg gctgtggtcc gattttaaga 120  
cgaggttctc aaagatccaa aggagggaaa gggatttga aacactgtgt atcatctgag 180  
acacacgtgt cctcatgac ttaaatgcct actttaaaag cacctaatac tgcccttcat 240  
tgtgttcaga agagatttct acaaaagcac tcagaattct ggaggcagtt gtgattttgc 300  
catgtggcag ttggtttgtg gagttgggca ggtgtgaaag ggtaaaactc cacttctgaa 360  
tgctgcttct gccccctggg acccagcaca ttgttagacc atcttcttga ctgaaaattc 420  
tctcctgatg ctgagccctg caccaccacc ttcttttcc taactatgaa ttgatggcaa 480  
agtccactca aaacaaccag ttaagtgtc acgagagagt agtcaagcac ctccagaaag 540  
aaaccgggtt tttgttcaca tagcaggaag tgactccctg ggtggtaatt tatcttggaa 600  
acacaggtag attggcagaa aaacgggaac atgtaggtag cgcgatgttg gtgcatgtcc 660  
attactttgg gataggcttt ctcagtcttt cctcaaatga tagttgagcc agttttccag 720  
tggcaattct gagtgacttg cgcttgtctt atgggtgtgt caagggacgt tcagaactac 780  
ggaaaacttt tactgaaaca gcgaagcaga gtataccggc atgagagggg agatgaacac 840  
tcacctatgt accactcttt gacaataaat atagtatttc tcaaaaaaaaa aaaaaaaaaa 900  
agtaaaaaaa ctgaaatcgc aagtcaaaaa atcca 935

&lt;210&gt; 421

&lt;211&gt; 745

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 421

ggcttcgagc ggccgcccgg gcaggtccta gatgtcattt gggacccttc acaaccattt 60  
tgaagccctg tttagtccc tgggatatgt gagctgtttc tatgcataat ggatattcgg 120  
ggttaacaac agtcccctgc ttggcttcta ttctgaatcc ttttctttca ccatggggtg 180  
cctgaagggg ggctgatgca tatggtacaa tggcaccag tgtaaagcag ctacaattag 240  
gagtggatgt gttctgtagc atcctattta aataagccta ttttatcctt tggcccgta 300  
actctgttat ctgctgcttg tactggtgcc tgtacttttc tgactctcat tgaccatatt 360  
ccacgaccat ggttgtcatc cattacttga tctacttta catgtctagt ctgtgtggtt 420  
ggtgggtgaat aggtctcttt ttacatgggt ctgccagccc agctaattaa tgggtgcacgt 480  
ggacttttag caagcgggct cactggaaga gactgaacct ggcatggaat tcctgaagat 540  
gtttgggggt tttttctttc ttaatcgaaa gttaacattg tctgaaaagt tttgttagaa 600  
ctactgcgga acctcaaaat cagtagattt ggaagtgatt caaagctaaa ctttttcctt 660  
ggccctcctt gtgttcta attgcttgcaag tgtaatacta ggatgtccaa gatgccagtt 720  
tttgcttctt tgtagttgt cagac 745

&lt;210&gt; 422

&lt;211&gt; 764

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 422

gagttcagta gcaaagtcac acctgtccaa ttccctgagc tttgtcact cagctaattgg 60  
gatggcaaag gtggtgggtg tttcatcttc aggcaagc ctctgcccac cccctcaag 120

124

```

ggctgcaggc ccagttctca tgctgccctt ggggtgggcat ctgttaacag aggagaacgt 180
ctgggtggcg gcagcagctt tgctctgagt gcctacaaaag ctaatgcttg gtgctagaaa 240
catcatcatt attaaacttc agaaaagcag cagccatgtt cagtcaggct catgctgcct 300
cactgcttaa gtgcctgcag gagccgcctg ccaagctccc ctccctacac ctggcacact 360
ggggctctgca caaggctttg tcaaccaaag acagcttccc ccttttgatt gcctgtagac 420
tttggagcca agaaacactc tgtgtgactc tacacacact tcagggtggtt tgtgcttcaa 480
agtcattgat gcaacttgaa aggaaacagt ttaatggtgg aaatgaacta ccatttataa 540
cttctgtttt tttattgaga aaatgattca cgaattccaa atcagattgc caggaagaaa 600
taggacgtga cggtagtggg ccctgtgatt ctcccagccc ttgcagtcctg ctagggtgaga 660
ggaaaagctc tttacttccg cccctggcag ggacttctgg gttatgggag aaaccagaga 720
tggaatgag gaaaatatga actacagcag aagcccctgg gcag 764

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&lt;210&gt; 423

&lt;211&gt; 1041

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 423

```

ctcagagagg ttgaaagatt tgccctacgaa agggacagtg atgaagctaa gctctagatc 60
caggatgtct gacttcaaatt tgaaactccc aaagtaatga gtttggagg gtgggggtgtg 120
gcctttccag gatgggggtc ttttctgctc ccagcggata gtgaaacccc tgtctgcacc 180
tggttgggag tggtgctttc ccaaagggtt tttttttagg tccgtcgctg tcttgtggat 240
taggcattat tatctttact ttgtctccaa ataacctgga gaatggagag agtagtgacc 300
agctcagggc cacagtgcga tgaggacat cttctcacct ctctaaatgc aggaagaaac 360
gcagagtaac gtggaagtgg tccacaccta ccgccagcac atgtgaatg acatgaaccc 420
cggcaacctg cacctgttca tcaatgccta caacaggtat tgggatgtag ttcagccaca 480
tcattgctat ttagagggtg tcttctgtag atccgaaatg tgggacagat gagagggaga 540
gtataaaatg agcggaaagag gcaggctctg agtttgagca aatagattaa taggacaggt 600
gtccccagga aggacacctg gcctgtgaag tgggtcctgg cattcagctc gcctgcagg 660
gatctgaaca aacactccag accactgggg gtgcagacgt gagagggacg cagtcgcaca 720
ctcagagggg tgagagtaaa tatgtgtgcc cgctgtgac cttcacgaaa ggccaaatgt 780
aagaagagct aagttagaga gcagcaaagc actcctggag gccggggata atccaggcag 840
gcttctggga gtttgtcatt ccaaggataa ggaggacctg aacatggcct ttgcctaagg 900
cgtggccctc tcaaccagca ctagggtgctt atctggagct cagctagggg aggagacagc 960
tcagggccat tgggtgtcagc cagagactct gtaatcttcc agggagctcg ctcaacctgc 1020
tgagctcgct ctgccacgca c 1041

```

&lt;210&gt; 424

&lt;211&gt; 1288

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 424

```

ctaagaactg agacttgtga cacaaggcca acgacctaa attagccag ggttgtagct 60
ggaagacctt caacccaagg atggaaggcc cctgtcacia agcctacct gatggataga 120
ggacccaagc gaaaaaggta tctcaagact aacggccgga atctggagg ccatgaccca 180
gaacccaagg aggatagaag cttgaagacc tggggaaatc ccaagatgag aacctaaac 240
cctacctctt ttctattgtt tacacttctt actcttagat atttccagtt ctctgttta 300
tctttaagcc tgattctttt gagatgtact ttttgatgtt gccggttacc tttagattga 360
cagtattatg cctgggccag tcttgagcca gctttaaatc acagctttta cctatttgtt 420
aggctatagt gttttgtaaa cttctgtttt tattcacatc ttctccactt gagagagaca 480
ccaaaatcca gtcagtatct aatctggctt ttgttaactt ccctcaggag cagacattca 540
tatagggtgat actgtatttc agtcctttct ttgacccca gaagccctag actgagaaga 600
taaaatgggtc aggttgttgg ggaaaaaaa gtgccaggct ctctagagaa aaatgtgaag 660
agatgctcca ggccaatgag aagaattaga caagaaatac acagatgtgc cagacttctg 720

```



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agaagcacct gccagcaaca gcttccttct ttgagcttag tccatccctc atgaaaaatg 780
actgaccact gctgggcagc aggagggatg atgaccaact aattcccaa cccagctctc 840
attggtacca gccttgggga accacctaca cttgagccac aattggtttt gaagtgcatt 900
tacaagtttc tggcatcact accactactg attaaacaag aataagagaa cattttatca 960
tcatctgctt tattcacata aatgaagttg tgatgaataa atctgctttt atgcagacac 1020
aaggaattaa gtggcttcgt cattgtcctt ctacctcaa gataatttat tccaaaagct 1080
aagataaatg gaagactctt gaacttgtga actgatgtga aatgcagaat ctcttttgag 1140
tctttgctgt ttggaagatt gaaaaatatt gttcagcatg ggtgaccacc agaaagtaat 1200
cttaagccat ctagatgtca caattgaaac aaactgggga gttggttgct attgtaaaat 1260
aaaaataact gttttgaaaa aaaaaaac

```

&lt;210&gt; 425

&lt;211&gt; 446

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 425

```

ccacttaaaag ggtgcctctg ccaactgggtg gaatcatcgc cacttccagc accacgcca 60
gcctaacatc ttccacaagg atcccgatgt gaacatgctg cacgtgtttg ttctgggcga 120
atggcagccc atcgagtacg gcaagaagaa gctgaaatac ctgccctaca atcaccagca 180
cgaatacttc ttcttgattg ggccgcccgt gctcatcccc atgtatttcc agtaccagat 240
catcatgacc atgatcgctc ataagaactg ggtggacctg gcctgggccc tcagctacta 300
catccgggttc ttcatcacct acatcccttt ctacggcatc ctgggagccc tccttttctt 360
caacttcac caggttcctgg agagccactg gtttgtgtgg gtcacacaga tgaatcacat 420
cgtcatggag attgaccagg aggacc

```

446

&lt;210&gt; 426

&lt;211&gt; 874

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 426

```

tttttttttt tttttttttt ttttttcaat taaagatttg atttattcaa gtatgtgaaa 60
acattctaca atggaaactt ttattaaatg ctgcatgtac tgtgctatgg accacgcaca 120
tacagccatg ctgtttcaga agacttgaaa tgccattgat agtttaaaaa ctctacaccc 180
gatggagaat cgaggaagac aatttaatgt ttcatctgaa tccagagggt catcaaatta 240
aatgacagct ccacttgcca aataatagct gttacttgat ggtatccaag aagaaatggg 300
tggtgatgga taaattcaga aatgcttccc caaagggtgg tggtttttta aaagttttca 360
ggtcacaacc cttgcagaaa aactgatgc ccaacacact gattcgcggt ccaggaaaca 420
cgggtcttcc aagttccaag gggctggggg tccccaacga tcaagtccct gtgctgtaat 480
caagagggtc ctttggactg gatagggagc acttgggagc tgtacaccat cagtcataat 540
ggatggcagt gtaaaagatg atccaaatga cctgagatgc tcctgaggag tgggtgcacca 600
gaccagagag tgccactgta gggctgcttc tttgctttag tcatcacaca cacacacagc 660
tccagagcag caatggcctt tcctgtaaca ggaaaaaagc ctctgctat tcccaagaac 720
cctcgtaatg gcaaaaactc ccaaatagaca cccaggacca cagcaatgat ctgtcggaac 780
cagtagatca catctaaaaa ttcatcotta tcctcccagg ccgcgtcgct ccgcagcacc 840
ttactccaga cggagacttt gagggccccg ttgg

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874

&lt;210&gt; 427

&lt;211&gt; 638

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 427

```

acttgtaatt agcacttggt gaaagctgga aggaagataa ataacactaa actatgctat 60
ttgatttttc tcttgaaag agtaagggtt acctgttaca ttttcaagtt aattcatgta 120
aaaaatgata gtgattttga tgtaatttat ctcttggttg aatctgtcat tcaaaggcca 180
ataatttaag ttgctatcag ctgatattag tagctttgca accctgatag agtaataaaa 240
ttttatgggc ggggtgccaaa tactgctgtg aatctatttg tatagtatcc atgaatgaat 300
ttatggaaat agatatttgt gcagctcaat ttatgcagag attaaatgac atcataatac 360
tggatgaaaa cttgcataga attctgatta aatagtgggt ctgtttcaca tgtgcagttt 420
gaagtattta aataaccact cctttcacag tttattttct tctcaagcgt tttcaagatc 480
tagcatgtgg attttaaaag atttgccctc attaacaaga ataacattta aaggagattg 540
tttcaaaata tttttgcaa ttgagataag gacagaaaga ttgagaaaca ttgtatattt 600
tgcaaaaaca agatgtttgt agctgtttca gagagagt 638

```

&lt;210&gt; 428

&lt;211&gt; 535

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 428

```

acaagatgat tcttcctcct caatttgaca gatcaaagaa gtatcccttg ctaattcaag 60
tgtatggtgg tccctgcagt cagagtgtaa ggtctgtatt tgctgttaat tggatatctt 120
atcttgcaag taaggaaggg atggtcattg ccttggtgga tggctgagga acagctttcc 180
aaggtgacaa actcctctat gcagtgtatc gaaagctggg tgtttatgaa gttgaagacc 240
agattacagc tgtcagaaaa ttcatagaaa tgggtttcat tgatgaaaaa agaatagcc 300
tatggggctg gtccatagga ggatacgtt catcactggc ccttgcatct ggaactggtc 360
ttttcaaatg tggatatagca gtggctccag tctccagctg ggaatattac gcgtctgtct 420
acacagagag attcatgggt ctcccaacaa aggatgataa tcttgagcac tataagaatt 480
caactgtgat ggcaagagca gaattttca gaaatgtaga ctatcttctc atcca 535

```

&lt;210&gt; 429

&lt;211&gt; 675

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 429

```

actattttca accctgagca ttaacactgc ataccaaggg ggggtgggtc aagaagctgg 60
ttagatcgaa gcacaagcac aagccactga tattctctat gtgatcaggt ttttcaaaa 120
aaatacatag ttttcaataa ataatgctta attttacaac tttgatacag caatgtcata 180
caccgtttca acacactaca ctctgcatgc tagatagtct acgagaagac gaaactttgc 240
catgcatttt ctttcccccc tagtgctatc aaacacttca tcctccagcg cactgcctca 300
ggtagcttta ctttctctct gtttcacagc aataggccgt gcgctggcat gcaaactcta 360
aaaaagggtc ccccaacaaa ccactcagac ttctacacaa aagggttttt cagcttttct 420
gtcccaaac ctggagtggc taagaaagta agtttcatgt ggccttgga aatacacact 480
tgtaaacagt gtcatgctga aaactgctct aaaacatcag gtggttctgt cctggtggcc 540
gtcacgaagc attatgggat gccataacca ctaggagtc caaaccggaa aaaataggcc 600
tccgttttaa aacagtcaat tcaaaaaagg tgtcacagaa caaatgcaaa agactcttaa 660
accacaaca tatgt 675

```

&lt;210&gt; 430

&lt;211&gt; 434

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 430

```

acctctgcca gaagtcacgc gagaggacct cacagtagag cacaggccac tccgggagtg 60
catcagaaga ttcacctca tggaggaaga aggcttcaaa cgtgaatggg taggagaagt 120

```

127

gagccacctt gtccattgcc agggacttgg tggcgcaggc ctgtgttact cctgagagct 180  
 gctggaatgc tgggcttgac cagtgcagcag ttggcaattc tacaaaagaag tggacgtaga 240  
 gattgtcata ctcatagcct tgggctgaaa cgacctctcc atttacaaaag agccggaggg 300  
 cacctgggac agtcatctca aagtcgggtgc ctacgaggct gctgagatac tccttgtgcc 360  
 ggccataaag atccttgaac actcgccgtt cccgctcctc ctctccggc tgtgcgtggg 420  
 gggaaacatt gtcg 434

&lt;210&gt; 431

&lt;211&gt; 581

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 431

acacaagcct ccagcccgcac ccagcggcct aatgaaactc tggcaacctc tcctgggcgt 60  
 ggccacgagt atccagctcc aagcccaagt gaggggggga gtcaacttcc ccatgattgc 120  
 caagtgaacca agaccagaag cagggacgat taggctagtt ctgcggcaag gtgaactgga 180  
 gacctgtct ctgccctcct tccttggcct gtcccacaga catcccggtg ttttaaccac 240  
 tgcttttgca aggacctgct ctgtccactc caaatcaaag gatacttgca tccttcttac 300  
 acagactccc atctctctgc tcatagtgtt cccaggctgc ccgagaaaaa gaaacttggg 360  
 tcagtagaag gctcattagt gtgaaggagt gagaggccag gccttcctgt gacataatgc 420  
 ttctatgctt gtttcctaaa cacttgggtcc acacacaata cctgggcagg aagagagaac 480  
 caagcaccac tggatggctc tggagccagg ggacttctat gcacatacaa ccaacatcac 540  
 cccactctgc tcatctgtgc ctccaccctg aacagcagag t 581

&lt;210&gt; 432

&lt;211&gt; 532

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 432

actccaactc aagttttacaa gttacacctt tgccacagcc ttggctaaat cttgaactag 60  
 tgcagaattc agctgtggta gagtgtgat cttagcatgc ttcatgtgg cactattgtt 120  
 cttgacagtc atgtgctttg taagtccttg atttaccatg actacattct tagccagggtg 180  
 ctgcataact ggaagaagag attcttcagt atatgacagg taatgttgta gaggttggtg 240  
 ccattcacca ttatccagaa ttttcagtgc taagcaaaaa gtcctgctg caatttgaga 300  
 aggaggaaaag tgcaccatgt catagtccaa catagttagt tccatcagggt atttggccaa 360  
 agtatgttgc tgcacatcaa cctctccaat cttagatgct ctccgaagga agtgcaaagg 420  
 tagaggccga cccagaccaa agtttaaaag tcttagaatc ttcatttcca tctgtctgat 480  
 ttggtgctta gtataagtgt tgtcagtcac aaaagcaaaag tcaccaattt ct 532

&lt;210&gt; 433

&lt;211&gt; 531

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 433

acttggtttt acagctcctt tgaaaactct gtgtttggaa tatctctaaa aacatagaaa 60  
 aactacagct ggttttagaaa ttactaattt tacttctaag tcattcataa acctgttcta 120  
 tgaaatgact tcttaaatat ttagttagata gactgctaca ggtaaataggg acttagcaag 180  
 ctcttttata tgctaaagga gcacttatca gattaagtta gaacatttgc tgtcagccac 240  
 atattgagat gacactagggt gcaatagcag ggatagattt tgttggtgag tagtctcatg 300  
 ccttgagatc tgtggtgggc ttcaaaatgg tggccagcca gatcaaggat gtagtatctc 360  
 atagttccca ggtgatattt ttcttattag aaaaatatta taactcattt gttgtttgac 420  
 acttatagat tgaaatttcc taatttattc taaattttaa gtggttcttt ggttccagtg 480  
 ctttatgttg ttgttgtttt tggatggtgt tacatattat atgttctaga a 531

<210> 434  
 <211> 530  
 <212> DNA  
 <213> Homo sapiens

<400> 434  
 acaagagaaa acccctaata aaaggatggc tttagatgac aagctctacc agagagactt 60  
 agaagttgca ctagctttat cagtgaagga acttccaaca gtcaccacta atgtgcagaa 120  
 ctctcaagat aaaagcattg aaaaacatgg cagtagtaaa atagaaacaa tgaataagtc 180  
 tcctcatatc tctaattgca gtgtagccag tgattattta gatttggata agattactgt 240  
 ggaagatgat gttggtggtg ttcaaggga aagaaaagca gcatctaaag ctgcagcaca 300  
 gcagaggaag attcttctgg aaggcagtga tggatagatg gctaatagaca ctgaaccaga 360  
 ctttgcacct ggtgaagatt ctgaggatga ttctgatttt tgtgagagtg aggataatga 420  
 cgaagacttc tctatgagaa aaagtaaagt taaagaaatt aaaaagaaag aagtgaaggt 480  
 aaaatcccca gtgaaaaaga aagagaagaa atctaaatcc aaatgtaatg 530

<210> 435  
 <211> 677  
 <212> DNA  
 <213> Homo sapiens

<400> 435  
 accttatgat ctaattaata gatattagaa acagtagaaa gacaagttac acgtcaatgc 60  
 ccaatgacta gagtcaacat taaagagttg taatttaagt aatccaaact gacatctaat 120  
 tccaaaatca ttataaaat gtatttggct ttggaatcca caggacttca aacaagcaaa 180  
 gtttcaactgc agatagtcac aaagatgcag atacactgaa atacttaaga gccttattaa 240  
 tgatttttgt tattttggat cttctgtttt tttcttatta tggccgaag cctccttaat 300  
 accaatttat cagacagaag catgtcatct tgttgttcaa gataatccag taaattttca 360  
 gtccattcaa gtgccgtttt atggctaata cgcttctctg gattcagttc tgtttttcta 420  
 ctcttactgg aaggcttttg ctcagcagcc ttggtctggt cctcagcact ttcactgtca 480  
 gtcagcacct gacagcttga gtcactgtc cgagagtcga accactgac aatattctca 540  
 atgtcaacat gttcacattc ttctgtgttc tgtaaaactg ttgctaaatt agctgctaaa 600  
 atggctcctt catcaatgtt catacctgaa ttctcttcat tgccagggaa aagttttttc 660  
 catgcttttg ttatggg 677

<210> 436  
 <211> 573  
 <212> DNA  
 <213> Homo sapiens

<400> 436  
 acctcttagg gtgggagaaa tggatgaagag ttgttcttac aacttgctaa cctagtggac 60  
 agggtagtag attagcatca tccgataga tgtgaagagg acggctgttt ggataataat 120  
 taaggataaa atttggccag ttgacagatt ctgtttccag cagtttttac agcaacagtg 180  
 gagtgcttca gtattgtgtt cctgtaaatt taattttgat ccgcaatcat ttggtataca 240  
 atgctgtttg aagttttgtc ctattggaaa agtcttgtgt tgcaggggtg cagttaagat 300  
 ctttgtgatg aggaatggga tgggctaatt ttttgcggt ttcttggaat tgggggcatg 360  
 gcaaatacag tagggtagtt tagttcttta cacagaacat gataaactac acctgttgat 420  
 gtcaccgtct gtcaatgaat attatagaag gtatgaaggt gtaattacca taataacaaa 480  
 acaccctgtc tttagggctg acctttctgc ctttgacctc ctcagcctcc attcccatct 540  
 tcgctcagac tgcaagtatg tttgtattaa tgt 573

<210> 437  
 <211> 645

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(645)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 437

```
acaattggta tccatatctt gttgaaattg taatgggaaa acaatatatt tcaatctcta 60
tgtagatagt gggtttttgt ttccataata tattctttta gtttactgta tgagttttgc 120
aggactgcat aatagatcac cacaatcata acatcttagg accacagaca tttatgagat 180
catggcttct gtgggttaga agtatgctca tgtcttaact gggtcctctg ctcagtctta 240
tctggctgca atcaaggtgt cagctgggct gaattttcat ttggaatctt gactgggaaa 300
gagctctgct ccaaggtcat gaagtttgct ggcaaaatgt atgtttttat gacagtatga 360
ctgaaatccc aagctatctc ctgactttta gctgggtaat ctcaggccct aaatgttgcc 420
tacagttcct agaggctggt cacagttcct agccatgtgg atttcctcaa catggctgct 480
tgcttcatca agtcagcaag aatagcctgt catatcagtg tatatcaggc tcactcagga 540
taatttccct actgatgagc caaacactaa ctgatttttag agcttaacta catctgcaa 600
attcngttca ccagaggcaa gtcattattca gggaaggaga agtgt 645
```

&lt;210&gt; 438

&lt;211&gt; 485

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 438

```
acagaattga gagacaagat tgcttgtaat ggagatgctt ctagctctca gataatacat 60
atcttctgatg aaaatgaagg aaaagaaatg tgtgttctgc gaatgactcg agctagacgt 120
tcccaggtag aacagcagca gctcatcact gttgaaaagg ctttggaat tctttctcag 180
cctacaccct cacttgttgt ggatcatgag cgattaaaaa atcttttgaa gactgttggt 240
aaaaaaagtc aaaactacaa catatttcag ttggaaaatt tgtatgcagt aatcagccaa 300
tgtattttatc ggcacgcaa ggaccatgat aaaacatcac ttattcagaa aatggagcaa 360
gaggtagaaa acttcagttg ttccagatga tgatgtcatg gtatcgagta ttctttatat 420
tcagttccta ttttaagtcatt ttttgcattg tccgcctaatt tgatgtagta tgaaaccctg 480
catct 485
```

&lt;210&gt; 439

&lt;211&gt; 533

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 439

```
acagcagttt cctcatccct gcagctgtgt ttgaacaggt catttaccat actgtcctcc 60
aggttcaaca gtatggctcc aaatgatgaa atttcattct gattttctgg ctgaagacta 120
ttctgtttgt gtatgtccac cacagttact ttatcccttc atctgtggat gggcagaatg 180
aaacatatat ggaaatgttc tgtgcaataa aaacagcagt ggtaacacag atgtaggctc 240
tgagtgtctc actggagact gaagtccaca gatatgcaac aaagcctttg tctccctgat 300
gtttttgcct cctgctggtc atgtgctttc acacatcaag agaggacatt taacatttga 360
gccacagtgt catttgctgt tgtctgatgg ttggttggca gagaatttga actggagatg 420
aactttatta tccaggacgc tgagagtata acatgcatga cagagctttt agagcactgt 480
gatgtaacat gtcaagcaga aatagggagc atgtttacag ccattctatg aaa 533
```

&lt;210&gt; 440

&lt;211&gt; 341

130

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 440

```
catggggtag gggggtcggg gattcattga attgtggttg gcaggagcaa gccctgctca 60
cactctcaca ctgcgaccca gaattgtcaa agatacagat tgtaaaaatc tacgatccct 120
cagtctcact cacaaaaaat aaaatctcat gtccccaacg aaccagagt cagacgacag 180
ctggagcatt ggcagggaca gtcagaaagg agacaagtga aaacggtcag atggacacag 240
gcggaggaga aaagacagag ggagagagac catcgggaac aatcagaggg gccgagacga 300
tcagaaaagg gtcagcccga gacaggctga gccagagttt c 341
```

&lt;210&gt; 441

&lt;211&gt; 572

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(572)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 441

```
aagtttgagg ataatttatt atgcagcaag agataatata caggacttct canagcactt 60
aatatgttaa tataaatctc caanaaaaaa gatatacaat gaaacattcc tcttagttat 120
ctggccaagg anactttntt tttttganaa tattcttcaa aaagctgac taatgatatg 180
gctctggtcc tacaattcca tgtaacttct aaccttgatt ttatctcatg agcaaatacat 240
ttatccttcc agaacctcaa cttttccctt ttacaaagta gaaataaacc atctgccttt 300
acataaatca ttaatacagc cctggatggg cagattctga gctatttttg gctggggggg 360
gggaaatagc ctgtggaggt cctaaaaaga tctacggggc tcgagatggg tctctgcaag 420
gtagcaggtg ggctcagggc ccatttcagt ctttggtccc caggccattt ccacaaaatg 480
gtgagaaata gtgtcttctt ttagcttgct cataactcaa agatgggggg catggacctg 540
ggcctttcta ggctagggca tgaacctcct cc 572
```

&lt;210&gt; 442

&lt;211&gt; 379

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(379)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 442

```
ttccagctgc actgcttaca cgtcttcctt cgtnttcacc taccgagagg ctgactcctt 60
ccccagntgt gcagctgccc accgcaaggg cagcagcagc aatgagcctt cctctgactc 120
gtcagctca cccacgctgc tggccctgtg agggggcagg gaaggggagg cagccggcac 180
ccacaagtgc cactgcccga gctggtgcat tacagagagg agaaacacat cttccctaga 240
gggttcctgt agacctaggg aggaccttat ctgtgctga aacacaccag gctgtggggc 300
tcaaggactt gaaagcatcc atgtgtggac tcaagtcctt acctcttccg gagatgtagc 360
aaaacgcatg gagtgtgta 379
```

&lt;210&gt; 443

&lt;211&gt; 511

&lt;212&gt; DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(511)

<223> n = A,T,C or G

<400> 443

```

acatgcccc aaaggctcgc ttcattgcta cgattctcta cttaaatacca cattcacagc 60
tattgcctca gacctcttgg aggaggggcc aggggttagc tggctttgaa tagcatgtag 120
agcacaggca gtgtggccac aaatgtcaca caggtagacca ggggtgctata gatgggtgtc 180
ctgttgactt gggcttctag tctctgtccc gtgtctgaca gtgccaagat catgctcccc 240
tgctccagca agaagctggg catagccccg tctgtctggt ccaccaggcc tgggtgtgct 300
gcagacttta caagctgaac caccacagcc atttggttac aagtcttttc taggccatca 360
agctgtcttc gtaagccttc tagacatgaa tggacttgcc tggaaatgact aagctgtctc 420
ttcaaggcag ctgaaaggac atcnacatct ctgtctctgg tcggggggact acctgcctgt 480
gaccagagt cctgccttgg cccagcagca t
511

```

<210> 444

<211> 612

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(612)

<223> n = A,T,C or G

<400> 444

```

acaggaagaa ttctacagtt aatctatcac agtgttccag caaagcatat gttgaaaact 60
acagttttca atctaacatc taaattttaa aaagtagcat ttcagcaaca aacaagctca 120
gagaggctca tggcaaaagt gaaataacag aactattgct cagatgtctg caaagtcaag 180
ctgtgcccct cagctccgcc cacttgaagg cttaggcaga cacgtaagggt ggcggtggct 240
ccttggcagc accattcaca gtggcatcat catacggagg tagcagcacc gtagtgtcat 300
tgctggtaac ataaaccagg acatcagagg agttcctacc attgatgtat cggtagcagt 360
tccaaacaca gctaatacaag taacccttaa aagtcaagat aatgctaata aacagaagaa 420
taataaggac caaacaggta ggattcactg acatgacatc atctctgtag ggaaaattag 480
gaggcagttg ccgtatgtat tcctgaatgg agtttggata aataagcaca gtgattgcaa 540
ccaacanctt caggggcaaag tcaaagatct ggtaacagaa gaatgggatg atccaggctg 600
cgcgttgctt gt
612

```

<210> 445

<211> 708

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(708)

<223> n = A,T,C or G

<400> 445

```

accatcctgt tccaacagag ccattgccta ttcctaaatt gaatctgact ggggtgtgccc 60
ctcctcggaa cacaacagta gaccttaata gtggaaacat cgatgtgcct cccaacatga 120
caagctgggc cagctttcat aatgggtgtg ctgctggcct gaagatagct cctgcctccc 180

```

132

```

agatcgactc agcttggatt gtttacaata agcccaagca tgctgagttg gccaatgagt 240
atgctggctt tctcatggct ctgggtttga atgggcacct taccaagctg gcgactctca 300
atatccatga ctacttgacc aaggggccatg aaatgacaag cattggactg ctacttgggtg 360
tttctgctgc aaaactaggc accatggata tgtctattac tcggcttggt agcattcgca 420
ttcctgctct cttaccccca acgtccacag agttggatgt tcctcacaat gtccaagtgg 480
ctgcagtggg tggcattggc cttgtatata aagggacagc tcacagacat actgcagaag 540
tcctgttggc tgagatagga cggcctcctg gtccctgaaat ggaatactgc actgacagag 600
agtcatactc cttagctgct ggcttggccc tgggcattgg ctncttgggg catggcagca 660
atttgatagg tatgtntgat ctcaatgtgc ctgagcagct ctatcagt 708

```

&lt;210&gt; 446

&lt;211&gt; 612

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 446

```

acaagcaacg cgcagcctgg atcatcccat tcttctgtta ccagatcttt gactttgccc 60
tgaacatggt ggttgcaatc actgtgctta tttatccaaa ctccattcag gaatacatat 120
ggcaactgcc tcctaatttt ccctacagag atgatgtcat gtcagtgaat cctacctgtt 180
tggctccttat tattcttctg tttattagca ttatcttgac ttttaagggg tacttgatta 240
gctgtgtttg gaactgctac cgatacatca atggtaggaa ctctctctgat gtcctggttt 300
atgttaccag caatgacact acgggtgctgc taccctcgta tgatgatgcc actgtgaatg 360
gtgctgccaa ggagccaccg ccaccttacg tgtctgccta agccttcaag tgggcggagc 420
tgagggcagc agcttgactt tgcagacatc tgagcaatag ttctgttatt tcacttttgc 480
catgagcctc tctgagcttg tttgttgctg aaatgctact ttttaaaatt tagatgttag 540
attgaaaact gtagttttca acatatgctt tgctggaaca ctgtgataga ttaactgtag 600
aattcttctt gt 612

```

&lt;210&gt; 447

&lt;211&gt; 642

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 447

```

actgaaagaa ttaaagtcag aagtcttccc aaaacaaaaa gaactgcccc cagagaaaat 60
cctttctgat acttttcatt gctaaaataa aacaggcggg aaatgtggaa aagaaattca 120
acaaaataat gtagcaccag aagaacaagt cctagatgat tcaagttcaa aaggtaagct 180
ccagcaatgt ggaagaggta aagaccaatg tagacaagct gacgaggaat atcttctttt 240
ttggttttct ggaagtagag ttcaggaaaa gcatgaagcc agtaagccag ctgtgatatg 300
tagaaaaact tcatttgaaa tgtcatcagg ttatggggat aagccctcca taagatagtt 360
gggtctgaga tgtagttttc agagatgaga atgaatgtgc cccaaacaca ggcaaaaagg 420
tagaacgcac taagctgacc agattcatta aacttgctgt gttttgtttt ggagaagtgc 480
attgcctgt taattttatc caacatatac tcttgaatta cggcatgaat aattatcgcc 540
actagcatgt agaagaaaac agtagccaaa tctttgatgc catagtaata aagggacact 600
gattcagtag cttgttcttc tgttgctggg agggtgacat tg 642

```

&lt;210&gt; 448

&lt;211&gt; 394

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(394)

&lt;223&gt; n = A,T,C or G



<400> 448  
accagaagac cttagaaaaa ggaggaaagg aggagaggca gataatttgg atgaattcct 60  
caaagngttt gaaaatccag aggttccttag agaggaccag caacagcagc atcagcagcg 120  
tgatgtttatc gatgagccca ttattgaaga gccaaagccgc ctccaggagt cagtgatgga 180  
ggccagcaga acaaacatag atgagtcagc tatgcctcca ccaccacctc agggagttaa 240  
gcgaaaagct ggacaaattg acccagagcc tgtgatgcct cctcagcagg tagagcagat 300  
ggaaatacca cctgtagagc ttccccaga agaacctcca aatatctgtc agctaatacc 360  
agagttagaa cttctgccag aaaaagagaa ggag 394

<210> 449  
<211> 494  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(494)  
<223> n = A,T,C or G

<400> 449  
acaaaaaaca caaggaatac aacccaatag aaaatagtcc tgggaatgtg gtcagaagca 60  
aaggcntgag tgtctttctc aaccgtgcaa aagccgtgtt cttcccgga aaccaggaaa 120  
aggatccgct actcaaaaac caagaattta aaggagtctt ttaaatctcg acctgtttc 180  
tgaagctcac ttttcagtgc cattgatgtg agatgtgctg gagtggctat taaccttttt 240  
ttcctaaaga ttattgttaa atagatattg tgggttgggg aagttgaatt ttttatagg 300  
taaatgtcat tttagagatg gggagaggga ttatactgca ggcagcttca gccatgttgt 360  
gaaactgata aaagcaactt agcaaggctt cttttcatta ttttttatgt ttcacttata 420  
aagtcttagg taactagtag gatagaaaca ctgtgtcccg agagtaagga gagaagctac 480  
tattgattag agcc 494

<210> 450  
<211> 547  
<212> DNA  
<213> Homo sapiens

<400> 450  
actttgggct ccagacttca ctgtccttag gcattgaaac catcacctgg tttgcattct 60  
tcatgactga ggtaactta aaacaaaaat ggtaggaaag ctttcctatg cttcgggtaa 120  
gagacaaatt tgcttttgta gaattggtgg ctgagaaagg cagacagggc ctgattaaag 180  
aagacatttg tcaccactag ccaccaagtt aagttgtgga acccaaaggt gacggccatg 240  
gaaacgtaga tcatcagctc tgctaagtag ttaggggaag aaacatattc aaaccagtct 300  
ccaaatggga tcctgtgggt acagtgaatg gccactcctg ctttattttt cctgagattg 360  
ccgagaataa catggcactt atactgatgg gcagatgacc agatgaacat catcatccca 420  
agaatatgga accaccgtgc ttgcatcaat agatttttcc ctgttatgta ggcattcctg 480  
ccatccattg gcacttggct cagcacagtt aggccaacaa ggacataata gacaagtcca 540  
aaacagt 547

<210> 451  
<211> 384  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature

134

&lt;222&gt; (1)...(384)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 451

```
actacttntt ggtaaang ccactgtag agtcatctga ntgtaaaca tgcctctgca 60
ctgctggaaa aatccactgg ctccaagaa aagaaaatgg tctgaagcct ctgttggtggc 120
tctcacaact catctttccc taagtcacat agtccacat cactgaggtc aatgtcatcc 180
tccacgggaa gctcgccatc cctgccgtcc caaggctctc tctcaacgat ggtagggaaa 240
gccccgcctc ctacaggtgc cgtggagcca cgccaaaag agagctccct gagaaactcg 300
ttgatgcctt gctcactgaa ggagcctttt agcagagcaa atttcatctt gcgtgcattg 360
atggcggcca tggcgggta ccca 384
```

&lt;210&gt; 452

&lt;211&gt; 381

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(381)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 452

```
actctaaagt tgccactctc acaggggtca gtgataccca ctgaacctgg caggaacagt 60
cctgcagcca gaatctgcaa gcagcgccctg tatgcaacgt ttagggccaa aggctgtctg 120
gtggggttgt tcatcacagc ataatggcct agtaggtcaa ggatccaggg tgtgaggggc 180
tcaaagccag gaaaacgaat cctcaagtcc ttcagtagtc tgatgagaac ttttaactgtg 240
gactgagaag cattttcctc gaaccagcgg gcatgtcgga tggctgctaa ngcactctgc 300
aatactttga tatccaaatg gagttctgga tccagtttcc naagattggg tggcactgtt 360
gtaatganaa tcttcactgt a 381
```

&lt;210&gt; 453

&lt;211&gt; 455

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 453

```
actgtgctaa acagcctata gccagttttt aaagagttac aggaacaact gctacacatt 60
caaagaacag gcattcactg cagcctcctg atttgacctg atgggagggg caggagaatg 120
agtcactctg ccaccacttt tctgccttg gatttgtaga ggatttggtt tgctctaatt 180
tgtttttctt atatctgccc tactaaggta cacagtctgg gcactttgaa aatgttaaag 240
tttttaacgt ttgactgaca gaagcagcac ttaaaggctt catgaatcta ttttccaaa 300
aaagtatgct ttcagtaaaa cattttacca ttttatctaa ctatgcactg acatttttgt 360
tcttcctgaa aaggggattt atgctaacac tgtattttta atgtaaaaat atacgtgtag 420
agatatttta acttcctgag tgacttatac ctcaa 455
```

&lt;210&gt; 454

&lt;211&gt; 383

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(383)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 454

```
acagagcanc tttacaagtt gtcacatttc tttataaatt tttttaaaagc tacagtttaa 60
tacaaaatga attgcggttt tattacatta ataacccttc acctcagggt tttatgaaga 120
ggaaaggggt ttatgcaaaa gaaagtgcta caattcctaa tcattttaga cacttttagga 180
gggggtgaag ttgtatgata aagcagatat ttttaattatt tgttatcttt ttgtattgca 240
agaaatttct tgctagtga tcaagaaaac atccagattg acagtctaaa atggctactg 300
gtatttttagt taattcaaaa atgaaacttt tcagtgatc actttactaa cattctattt 360
gagaaggctt attggtaaag ttt                                     383
```

&lt;210&gt; 455

&lt;211&gt; 383

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(383)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 455

```
actcctttan gacaaggaaa caggtatcag catgatggta gcagaaacct taccaccaag 60
gtgcaggagc tgacttcttc caaagagttg tgggtccggg cagcgggtcat tgccgtgccc 120
attgctggag ggctgatttt agtggttgctt attatggttg ccctgaggat gcttcgaagt 180
gaaaataaga ggctgcagga tcagcggcaa cagatgctct cccgtttgca ctacagcttt 240
cacggacacc attccaaaaa ggggcaggtt gcaaagttag acttggaatg catggtgccg 300
gtcagtgggc acgagaactg ctgtctgacc tgtgataaaa tgagacaagc agacctcagc 360
aacgataaga tcctctcgct tgt                                     383
```

&lt;210&gt; 456

&lt;211&gt; 543

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (1)...(543)

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 456

```
acaaacattt tacaaaaaag aacattacca atatcagtgg cagtaagggc aagctgaaga 60
atangtagac tgagtttccg ggcaatgtct gtcctcaaag acatccaaac tgcgttcagg 120
cagctgaaac aggttctttt cccagtgaac agcatatgtg gtcagtaata caaacgatgg 180
taaagtaggc tactacatag gcccagttaa caaactcctc ttctcctcgg gtaggccatg 240
atacaagtgg aactcatcaa ataatttaaa cccaaggcga taacaacact atttcccatc 300
taaactcatt taagccttca caatgtcgca atggattcag ttacttgcaa acgatcccgg 360
gttgtcatac agatacttgt tttttacaca taacgctgtg ccaccccttc cttcactgcc 420
ccagtccagg ttctctgttg tggaccgaaa ggggatacat tttagaatg cttccctcaa 480
gacagaagtg agaaagaaa gagaccctga ggccaggatc tattaaacct ggtgtgtgcg 540
caa                                     543
```

&lt;210&gt; 457

&lt;211&gt; 544

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(544)  
<223> n = A,T,C or G

<400> 457

```
actggtgcc  atattgncat  ggtgagctcc  tctctaattgt  cttccagggc  accaatatct  60
gcccattgtca  cattagggac  agtgacaaag  ccttcccttt  tggcagaggg  ttggactgag  120
gatagagcaa  caatgaaatc  attcagttca  atgcacagtc  cttgcatctg  ctcctctgag  180
aggggatctt  ggtctcttag  caaccccagc  agcctttgta  attcatcctg  tgtttcagaa  240
gtgggctcag  ttcccagcct  ttctcctgg  actcctttag  atggcaaata  ttccatttca  300
ggatttttct  tctgctgttc  ctgtagcttc  attaagactc  tattgactgc  acacattgct  360
gcctctcggc  acagtgccat  gagatcagca  ccaacaaagc  ctggagttag  gtgtgctaag  420
tgacagaaat  caaaagcttg  aggaagcctc  agttttctgc  acaatgtttg  aagtattctt  480
tccctggatg  cttcatctgg  gatacctagg  catattttct  ggtcgaacct  tcccgcacgt  540
ctca                                             544
```

<210> 458  
<211> 382  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(382)  
<223> n = A,T,C or G

<400> 458

```
acctntaggc  tcaacggcag  aancttcacc  acaaaagcga  aatgggcaca  ccacagggag  60
aaaactgggt  gtcctggatg  tttgaaaagt  tggctggtgt  catggtgtgt  tacttcatcc  120
tatctatcat  taactccatg  gcacaaagt  atgccaaacg  aatccagcag  cggttgaact  180
cagaggagaa  aactaaataa  gtagagaaag  ttttaaaactg  cagaaattgg  agtggatggg  240
ttctgcctta  aattgggagg  actccaagcc  gggaaggaaa  attccctttt  ccaacctgta  300
tcaattttta  caactttttt  cctgaaagca  gtttagtcca  tactttgcac  tgacataact  360
tttccttctg  tgctaaggta  ag                                             382
```

<210> 459  
<211> 168  
<212> DNA  
<213> Homo sapiens

<400> 459

```
ctcgtactct  agccaggcac  gaaaccatga  agtagcctga  tccttcttag  ccatcctggc  60
cgcttagcgc  gtagtaactt  tgtgttatga  atcacatgaa  agcatggaat  cttatgaact  120
taatcccttc  attaacagga  gaaatgcaaa  taccttcata  tccctca     168
```

<210> 460  
<211> 190  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (1)...(190)

<223> n = A,T,C or G

<400> 460

```

acancctgcta ccagggagcc gagagctgac tatcccagcc tcggctaatag tattctacgc 60
catggatgga gcttcacacg atttcctcct ggggcagcgg cgaaggctcct ctactgctac 120
acctggcgctc accagtggcc cgtctgcctc aggaactcct ccgagtgagg gaggaggggg 180
ctcctttccc                                     190

```

<210> 461

<211> 495

<212> DNA

<213> Homo sapiens

<400> 461

```

acagacaggc ttctctgcta tcctccaggc agtgtaatag tcaaggaaaa gggcaacagt 60
attggatcat tccttagaca ctaatcagct ggggaaagag ttcattggca aaagtgtcct 120
cccaagaatg gtttacacca agcagagagg acatgtcact gaatggggaa agggaacccc 180
cgtatccaca gtcactgtaa gccagctccg gaacgagggtc atcttctaca ggttcttcct 240
atgaaagcag atttgagata cccagctccg gaacgagggtc atcttctaca ggttcttcct 300
tactgagac aatgaattca gggatgatcat tctctgaggg gctgagaggt gcttcctcga 360
ttttcactac cacattagct tggctctctg tctcagaggg tatctctaag actaggggct 420
tggtatatat gtggcctaaaa cgaattaggt cattaatggc ttccagcttg gctgatgacg 480
tccccactga cagag                                     495

```

<210> 462

<211> 493

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> (1)...(493)

<223> n = A,T,C or G

<400> 462

```

aactgaaac ataatccgc aagtcaccac acatacaaca cccggcagga aaaaaacaaa 60
aacaggngt ttacatgatc cctgtaacag ccatgggtctc aaactcagat gcttcctcca 120
tctgccagt gtgttttggg tacagagcac atcgtggctt ctgggggtcac actcagctta 180
ggctgtgggt ccacagagca ctcatctggc tgggctatgg tgggtgggtggc tctactcaag 240
aagcaaagca gttaccagca cattcaaaca gtgtattgaa catcttttaa atatcaaagt 300
gagaaacaag aaggcaacat aataatgtta tcagaaagat gttaggaagt aaggacagct 360
gtgtaaagct tgaggctgaa aagtagcttg ccagcttcac ttctttgggt tcttggttag 420
tgggcgcccg aacagcaaga tgtgaggttc tgggttcattg atcatataat ggacccatcc 480
ctgactctgc tga                                     493

```

<210> 463

<211> 3681

<212> DNA

<213> Homo sapiens

<400> 463

```

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ctagctggcc ctgtgggcat ttattagtaa agttttaatg acaaaagctt tgagtcaaca 120
caccgtggg taattaacct ggtcatcccc accctggaga gccatcctgc ccatgggtga 180
tcaaagaagg aacatctgca ggaacacctg atgaggctgc acccttggtg gaaagaacac 240

```

```

ctgacacagc tgaaagcttg gtggaaaaaa cacctgatga ggctgcaccc ttggtggaaa 300
gaacacctga cagggtgaa agcttggtgg aaaaaacacc tgatgagget gcatccttgg 360
tgaggggaac atctgacaaa attcaatgtt tggagaaagc gacatctgga aagttcgaac 420
agtcagcaga agaaacacct agggaaatta cgagtcctgc aaaagaaaca tctgagaaat 480
ttacgtggcc agcaaaagga agacctagga agatcgcatg ggagaaaaaa gaagacacac 540
ctagggaaat tatgagtcct gcaaaagaaa catctgagaa atttacgtgg gcagcaaaag 600
gaagacctag gaagatcgca tgggagaaaa aagaaacacc tgtaaagact ggatgctgtg 660
caagagtaac atctaataaa actaaagtgt tggaaaaagg aagatctaag atgattgcat 720
gtcctacaaa agaatacatc acaaaagcaa gtgccaatga tcagagggtc ccatacagaat 780
ccaaacaaga ggaagatgaa gaatattctt gtgattctcg gactctcttt gagagttctg 840
caaagattca agtgtgtata cctgagtcct tatatcaaaa agtaatggag ataaatagag 900
aagtagaaga gcctcctaag aagccatctg ccttcaagcc tgccattgaa atgcaaaact 960
ctgttccaaa taaagccttt gaattgaaga atgaacaaac attgagagca gatccgatgt 1020
tcccaccaga atccaaacaa aaggactatg aagaaaattc ttgggattct gagagtctct 1080
gtgagactgt ttacacagaag gatgtgtgtt tacccaaggc tacacatcaa aaagaaatag 1140
ataaaataaa tggaaaatta gaagagcttc ctaataaaga tgggtcttctg aaggctacct 1200
gcggaatgaa agtttctatt ccaactaaag ccttagaatt gaaggacatg caaactttca 1260
aagcagagcc ttcggggaag ccatctgcct tcgagcctgc cactgaaatg caaaagctctg 1320
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cagaatccaa acaaaaggac tatgaagaaa gttcttgga ttctgagagt ctctgtgaga 1800
ctgtttcaca gaaggatgtg tgtttaccca aggctrcrca tcaaaaagaa atagataaaa 1860
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tgaaagtttc taattccact aaagccttag aattgatgga catgcaaaact ttcaaaagcag 1980
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aatcaaaaca aaagaasgtt gaagaaaatt cttgggattc tgagagcttc cgtgagactg 2160
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tcatgaaaat gaaaattatc tcttacatga aaattgcatg ttgaaaaagg aaattgccat 2520
gctaaaactg gaaatagcca cactgaaaca ccaataccag gaaaaggaaa ataaatactt 2580
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agaggaatca ttaactaaaa gggcatctca atatagtggg cagcttaaaag ttctgatagc 2700
tgagaacaca atgctcactt ctaaattgaa ggaaaaacaa gacaaaagaa tactagaggc 2760
agaaattgaa tcacaccatc ctgactggc ttctgtgta caagaccatg atcaaattgt 2820
gacatcaaga aaaagtcaag aacctgcttt ccacattgca ggagatgctt gtttgcaaa 2880
aaaaatgaat gttgatgtga gtagtacgat atataacaat gaggtgctcc atcaaccact 2940
ttctgaagct caaaggaaat ccaaaagcct aaaaattaat ctcaattatg cmggagatgc 3000
tctaagagaa aatacattgg tttcagaaca tgcacaaaga gaccaacgtg aaacacagtg 3060
tcaaatgaag gaagctgaac acatgtatca aacgaacaa gataatgtga acaaacacac 3120
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tcaacagcaa ttagttcatg cacataagaa agctgacaac aaaagcaaga taacaattga 3240
tattcatttt cttgagagga aaatgcaaca tcatctccta aaagagaaaa atgaggagat 3300
atttaattac aataaccatt taaaaaacg tatatatcaa tatgaaaaag agaaagcaga 3360
aacagaaaac tcatgagaga caagcagtaa gaaacttctt ttggagaaac aacagaccag 3420
atctttactc acaactcatg ctaggaggcc agtcctagca tcaccttatg ttgaaaatct 3480
taccaatagt ctgtgtcaac agaatactta ttttagaaga aaaattcatg atttcttcct 3540

```

139

gaagcctaca gacataaaat aacagtgtga agaattactt gttcacgaat tgcataaaagc 3600  
tgcacaggat tcccatctac cctgatgatg cagcagacat cattcaatcc aaccagaatc 3660  
tcgctctgtc actcaggctg g 3681

&lt;210&gt; 464

&lt;211&gt; 1424

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 464

tccgagctga ttacagacac caaggaagat gctgtaaaga gtcagcagcc acagccctgg 60  
ctagctggcc ctgtgggcat ttattagtaa agttttaatg acaaaagctt tgagtcaaca 120  
caccctggg taattaacct ggatcatccc accctggaga gccatcctgc ccatgggtga 180  
tcaaagaagg aacatctgca ggaacacctg atgaggctgc acccttggcg gaaagaacac 240  
ctgacacagc tgaaagcttg gtggaaaaaa cacctgatga ggctgcaccc ttggtggaaa 300  
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agtcagcaga agaaacacct agggaaatta cgagtcctgc aaaagaaaca tctgagaaat 480  
ttacgtggcc agcaaaagga agacctagga agatcgcatg ggagaaaaaa gaagacacac 540  
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gaagacctag gaagatcgca tgggagaaaa aagaaacacc tgtaaagact ggatgcgtgg 660  
caagagtaac atctaataaa actaaagttt tggaaaaagg aagatctaag atgattgcat 720  
gtcctacaaa agaatcatct acaaaagcaa gtgccaatga tcagagggtc ccatcagaat 780  
ccaaacaaga ggaagatgaa gaatattctt gtgattctcg gagtctcttt gagagtctctg 840  
caaagattca agtgtgtata cctgagtcta tatatcaaaa agtaatggag ataaatagag 900  
aagtagaaga gcctcctaag aagccatctg ccttcaagcc tgccattgaa atgcaaaact 960  
ctgttccaaa taaagccttt gaattgaaga atgaacaaac attgagagca gatccgatgt 1020  
tcccaccaga atccaaacaa aaggactatg aagaaaattc ttgggattct gagagtctct 1080  
gtgagactgt ttcacagaag gatgtgtgtt tacccaaggc tacacatcaa aaagaaatag 1140  
ataaaataaa tggaaaatta gaaggtaaga accgtttttt atttaaaaat cagttgaccg 1200  
aatatttctc taaactgatg agggaggata tcctctagta gctgaagaaa attacctcct 1260  
aatgcaaac catggaaaaa aagagaagtg caatggctcg aagttgtatg tctcatcagg 1320  
tggtggcaac agactatatt gagagtgtcg aaaaggagct gaattattag tttgaattca 1380  
agatattgca agacctgaga gaaaaaaaaa aaaaaaaaaa aaaa 1424

&lt;210&gt; 465

&lt;211&gt; 674

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 465

attccgagct gattacagac accaaggaag atgctgtaaa gagtacgag ccacagccct 60  
ggctagctgg ccctgtgggc atttattagt aaagttttaa tgacaaaagc tttgagtcaa 120  
cacaccctg ggtaattaac ctggtcatcc ccaccctgga gagccatcct gccatgggt 180  
gatcaaagaa ggaacatctg caggaacacc tgatgaggct gcacccttgg cggaaagAAC 240  
acctgacaca gctgaaagct tgggtgaaaa aacacctgat gaggctgcac ccttgggtgga 300  
aagaacacct gacacggctg aaagcttggg ggaaaaaaca cctgatgagg ctgcatcctt 360  
ggtggaggga acatctgaca aaattcaatg tttggagaaa gcgacatctg gaaagtctga 420  
acagtcagca gaagaaacac ctagggaaat tacgagtcct gcaaaagaaa catctgagaa 480  
atttacgtgg ccagcaaaag gaagacctag gaagatcgca tgggagaaaa aagatgactc 540  
agttaaggca aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 600  
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 660  
aaaaaaaaaa aaaa 674

&lt;210&gt; 466

<211> 1729  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> unsure  
 <222> (11)  
 <223> n=A,T,C or G  
 <221> unsure  
 <222> (1128)  
 <223> n=A,T,C or G

<400> 466  
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 aagaagacac acctagggaa attatgagtc ccgcaaaaga aacatctgag aaatttacgt 180  
 gggcagcaaa aggaagacct aggaagatcg catgggagaa aaaagaaaca cctgtaaaga 240  
 ctggatgctg ggcaagagta acatctaata aaactaaagt tttggaaaaa ggaagatcta 300  
 agatgattgc atgtcctaca aaagaatcat ctacaaaagc aagtgcgaat gatcagaggt 360  
 tcccatcaga atccaaacaa gaggaagatg aagaatattc ttgtgattct cggagtctct 420  
 ttgagagttc tgcaaaagatt caagtgtgta tacctgagtc tatatatcaa aaagtaattg 480  
 agataaatag agaagtagaa gagcctccta agaagccatc tgccttcaag cctgccattg 540  
 aaatgcaaaa ctctgttcca aataaagcct ttgaattgaa gaatgaacaa acattgagag 600  
 cagatccgat gttcccacca gaatccaaac aaaaggacta tgaagaaaat tcttgggatt 660  
 ctgagagtct ctgtgagact gtttcacaga aggatgtgtg tttacccaag gctacacatc 720  
 aaaaagaaat agataaaata aatggaaaat tagaagagtc tcctaataaa gatggtcttc 780  
 tgaaggctac ctgcggaatg aaagtttcta ttccaactaa agccttagaa ttgaaggaca 840  
 tgcaaaacttt caaagcagag cctccgggga agccatctgc cttcgagcct gccactgaaa 900  
 tgcaaaagtc tgtcccaaat aaagccttgg aattgaaaaa tgaacaaaca ttgagagcag 960  
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 aaaagtctgt tccaaataaa gccttggaat tgaagaatga acaaacattg agagcagatg 1320  
 agatactccc atcagaatcc aaacaaaagg actatgaaga aagttcttgg gattctgaga 1380  
 gtctctgtga gactgtttca cagaaggatg tgtgtttacc caaggctgcg catcaaaaag 1440  
 aaatagataa aataaatgga aaattagaag gtaagaaccg ttttttattt aaaaatcatt 1500  
 tgaccaataa tttctctaaa ttgatgagga aggatatcct ctagtagctg aagaaaatta 1560  
 cctcctaaat gcaaaccatg gaaaaaaga gaagtgcaat ggtcataagc tatgtgtctc 1620  
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 aattcaagat attccaagac gtgaggaaaa tgagaaaaaa aaaaaaaaaa 1729

<210> 467  
 <211> 1337  
 <212> DNA  
 <213> Homo sapiens

<400> 467  
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 tgaaggctaa ctgcggaatg aaagtttcta ttccaactaa agccttagaa ttgatggaca 120  
 tgcaaaacttt caaagcagag cctcccagaa agccatctgc cttcgagcct gccattgaaa 180  
 tgcaaaagtc tgttccaaat aaagccttgg aattgaagaa tgaacaaaca ttgagagcag 240  
 atgagatact cccatcagaa tccaaacaaa aggactatga agaaagttct tgggattctg 300  
 agagtctctg tgagactgtt tcacagaagg atgtgtgttt acccaaggct gcgcatcaa 360



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aagaaataga taaaataaat ggaaaattag aagagtctcc tgataatgat ggttttctga 420
aggctccctg cagaatgaaa gtttctattc caactaaagc cttagaattg atggacatgc 480
aaactttcaa agcagagcct cccgagaagc catctgcctt cgagcctgcc attgaaatgc 540
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agatgttccc ttcagaatca aaacaaaaga aggttgaaga aaattcttgg gattctgaga 660
gtctccgtga gactgtttca cagaaggatg tgtgtgtacc caaggctaca catcaaaaag 720
aaatggataa aataagtgga aaattagaag attcaactag cctatcaaaa atcttggata 780
cagttcattc ttgtgaaaga gcaagggaac ttcaaaaaga tcaactgtga caacgtacag 840
gaaaaatgga acaaatgaaa aagaagtttt gtgtactgaa aaagaaactg tcagaagcaa 900
aagaaataaa atcacagtta gagaaccaa aagttaaatg ggaacaagag ctctgcagtg 960
tgagattgac tttaaaccaa gaagaagaga agagaagaaa tgccgatata ttaaatgaaa 1020
aaattaggga agaattagga agaatcgaag agcagcatag gaaagagtta gaagtgaac 1080
aacaacttga acaggctctc agaatacaag atatagaatt gaagagtgtg gaaagtaatt 1140
tgaatcaggt ttctcacact catgaaaatg aaaattatct cttacatgaa aattgcatgt 1200
tgaaaaagga aattgccatg ctaaaactgg aaatagccac actgaaacac caataccagg 1260
aaaaggaaaa taaatacttt gaggacatta agattttaaa agaaaagaat gctgaacttc 1320
agatgacccc tcgtgcc                                     1337

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&lt;210&gt; 468

&lt;211&gt; 2307

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 468

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142

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&lt;211&gt; 650

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; unsure

&lt;222&gt; (310)

&lt;223&gt; Xaa = Any Amino Acid&lt;221&gt; unsure

&lt;222&gt; (429)

&lt;223&gt; Xaa = Any Amino Acid&lt;221&gt; unsure

&lt;222&gt; (522)

&lt;223&gt; Xaa = Any Amino Acid

&lt;400&gt; 469

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143

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144

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146

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147

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148

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149

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&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

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International Bureau



(43) International Publication Date  
12 October 2000 (12.10.2000)

PCT

(10) International Publication Number  
**WO 00/60076 A3**

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15/52, C07K 14/47, C12N 9/00, 5/10, 1/21, A61K 38/17,  
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C07K 19/00, C12N 15/62, 5/00, G01N 33/68, C12Q 1/68,  
C12N 15/11

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(21) International Application Number: PCT/US00/05308

(74) Agents: **MAKI, David, J.** et al.; Seed Intellectual Property  
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WA 98104-7092 (US).

(22) International Filing Date: 15 February 2000 (15.02.2000)

(81) Designated States (*national*): AE, AL, AM, AT, AU, AZ,  
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DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL,  
IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU,  
LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT,  
RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA,  
UG, US, UZ, VN, YU, ZA, ZW.

(25) Filing Language: English

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09/433,826 3 November 1999 (03.11.1999) US

(84) Designated States (*regional*): ARIPO patent (GH, GM,  
KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent  
(AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent  
(AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU,  
MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM,  
GA, GN, GW, ML, MR, NE, SN, TD, TG).

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Published:  
— with international search report

(72) Inventors; and

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WA 98052 (US). **XU, Jiangchun** [US/US]; 15805 S.E.

(88) Date of publication of the international search report:  
20 December 2001

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*



**WO 00/60076 A3**

(54) Title: COMPOSITIONS FOR THE TREATMENT AND DIAGNOSIS OF BREAST CANCER AND METHODS FOR THEIR USE

(57) Abstract: Compositions and methods for the therapy and diagnosis of cancer, such as breast cancer, are disclosed. Compositions may comprise one or more breast tumor proteins, immunogenic portions thereof, or polynucleotides that encode such portions. Alternatively, a therapeutic composition may comprise an antigen presenting cell that expresses a breast tumor protein, or a T cell that is specific for cells expressing such a protein. Such compositions may be used, for example, for the prevention and treatment of diseases such as breast cancer. Diagnostic methods based on detecting a breast tumor protein, or mRNA encoding such a protein, in a sample are also provided.

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 00/05308

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7    C12N15/12    C12N15/52    C07K14/47    C12N9/00    C12N5/10 C12N1/21    A61K38/17    A61K39/00    C07K16/30    C07K16/32 C07K16/40    A61K39/395    A61K35/12    C07K19/00    C12N15/62		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC 7    C07K    C12N		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, STRAND, WPI Data, BIOSIS		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 98 33915 A (HUMAN GENOME SCIENCES INC ;ROSEN CRAIG A (US); JI HONGJUN (US)) 6 August 1998 (1998-08-06) ---	4,7
A	WO 96 29430 A (WAYNE JOHN CANCER INST ;NAT GENETICS INST (US)) 26 September 1996 (1996-09-26) ---	
X	WO 99 09155 A (ENDRESS GREGORY A ;FLORENCE KIMBERLY A (US); HUMAN GENOME SCIENCES) 25 February 1999 (1999-02-25) SEQ ID NO 65 -----	
<input type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
* Special categories of cited documents : <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&amp;" document member of the same patent family</p> </div> </div>		
Date of the actual completion of the international search  <div style="text-align: center; font-weight: bold;">23 August 2000</div>		Date of mailing of the international search report  <div style="text-align: center; font-weight: bold;">21. 11. 00</div>
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer  <div style="text-align: center; font-weight: bold;">VAN DER SCHAAL C.A.</div>

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/05308

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N5/00 G01N33/68 C12Q1/68 C12N15/11

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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Date of the actual completion of the international search

23 August 2000

Date of mailing of the international search report

Name and mailing address of the ISA

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Authorized officer

VAN DER SCHAAL C.A.

# INTERNATIONAL SEARCH REPORT

Int. application No.  
PCT/US 00/05308

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:  
  
Although claims 29-34 48 49 52 53 55-57 are (partially) directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Claims 1-79 Partially.

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: Invention 1: Claims 1-79 partially

Polypeptide (portion) encoded by the polynucleotide sequence SEQ ID NO 2, the encoding polynucleotides, antibodies against the polypeptide and their uses

2. Claims: Inventions 2-464: claims 1-79 partially

(use of) a polypeptide (portion) encoded by the polynucleotide sequence selected from SEQ ID NO 1-175, 178 180 and 182-468, the encoding polynucleotides, or antibodies against the polypeptide as far as applicable

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/05308

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9833915 A	06-08-1998	AU 6257298 A EP 1015582 A	25-08-1998 05-07-2000
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